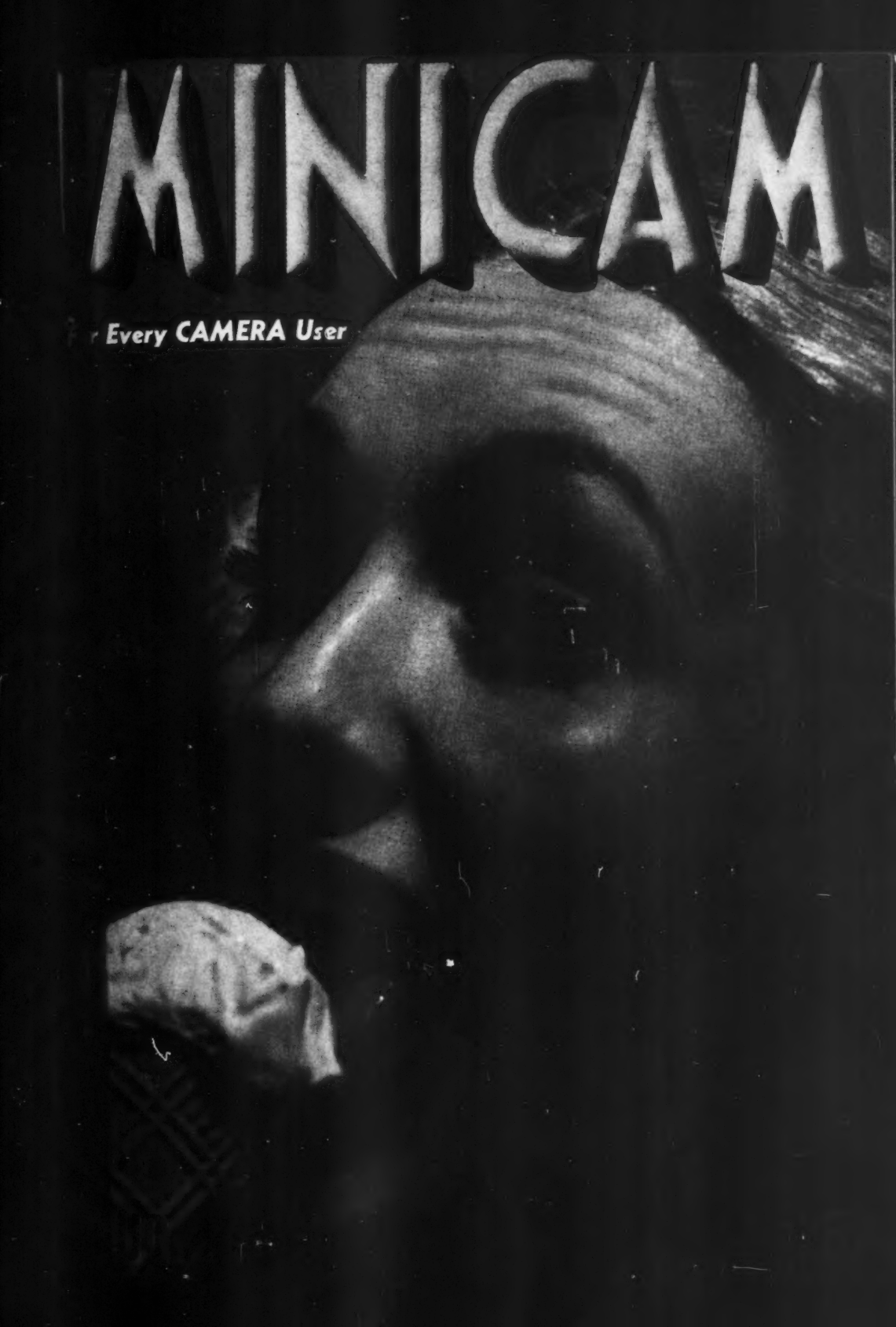
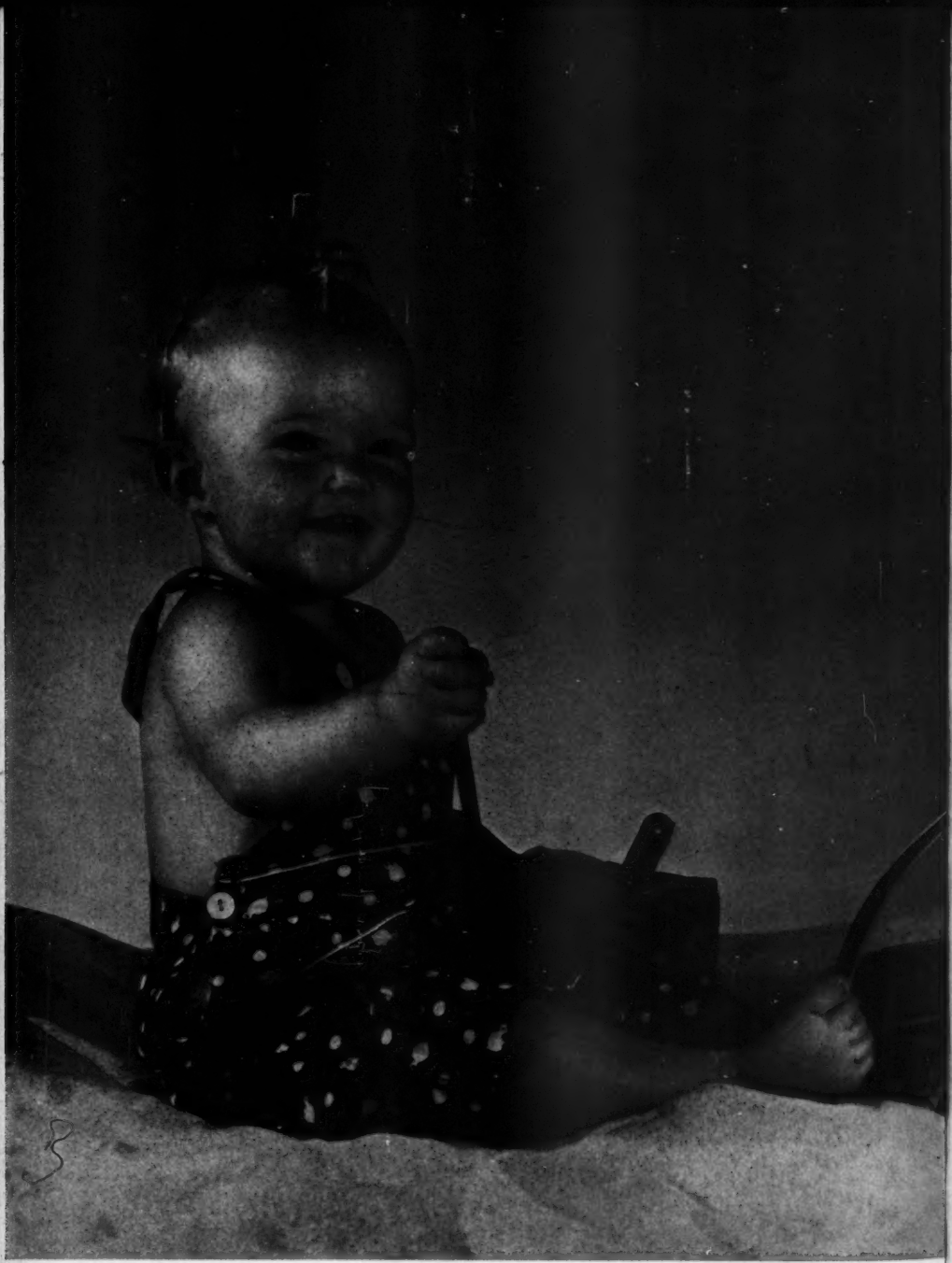

MINICAM
r Every CAMERA User



BEACH BABE MAC NICHOL-CUMMIN

For children and babies, outdoor surroundings and color film make a perfect combination. Although the above color photograph was made in a studio with sand spread on the floor to give the appearance of a beach, the subject seemed to enjoy it as much as the real thing. Note the excellent reproduction of skin texture. For rendering flesh tones in color, correct exposure is essential and must be judged carefully.

GO AS FAR AS YOU LIKE!

HAVEN'T there been times when you've wished that the film you were using was a little more versatile? That it would give you excellent results, in portraiture as well as in pictorial work?

There IS a film like that!

There is a film you can depend on to make the most of any subject, whether it's an airplane, a portrait, or the girls at the bathing beach. If you doubt it, load your camera with *Agfa Super Plenachrome,* and see for yourself!

Super Plenachrome is adapted to the widest range of subjects, indoors and out. It has high speed, wide latitude, and beautiful emulsion balance. It is fully sensitive to all colors except spectral red. And you can develop it by inspection under red safelight.

Your dealer has Agfa Super Plenachrome, in Rolls and Packs. Try it . . . and convince yourself of its amazing versatility! **Made by Agfa Ansco Corporation in Binghamton, New York.**

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C O N T E N T S

Vol. 1 AUGUST, 1938 No. 12

MINICAM MONTHLY

WILL LANE, *Editor*

COVER

ARTICLES

FIVE-MINUTE FEATURES

DEPARTMENTS

CINECAM

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"If the Eye Were a Camera"

Sirs:

I cannot refrain from writing to you in reference to the article "If the Eye Were a Camera" in your July issue. The text was well presented, but the illustrations were highly impossible and imaginative.

The retina is a delicate tissue and cannot be handled as is shown on page 14. Its thickness is from .1 to .3 millimeters averaging .2 of a millimeter in thickness. The retina lines the eyeball (as the innermost of its three layers), and since the eyeball is usually about 25mm. or 1 inch in length and width, the retina could hardly be as large as shown in your illustration. The optic nerve head (into which the blood vessels are seen to run) is larger than the man's thumb nail. Its true dimension is 1.5 to 2 mm in diameter. The blood vessels are similarly distorted.

The top two illustrations on page 15 showing the processes are impossible for the same reasons. To cap the whole hoax, the last illustration shows the developed image situated on the optic nerve head, the point of entrance of the optic nerve into the eye. This is known as 'the physiologic blind spot," and is the only place an image would not be recognized. The place the image would be found is the "fovea centralis" or the macula area of the eye; this is the area of clearest vision.

I hope you realize that this is not a vicious

$2000

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CASH FOR PICTURES!

JUST AIM YOUR CAMERA AND *SHOOT*

HERE'S THE EASIEST, MOST INTERESTING PHOTO CONTEST EVER PRESENTED!

JUST AIM YOUR CAMERA at people writing. Take their pictures. Send us prints. We don't care what they are writing or how! The sky is the limit! For example—a shot of a plane writing in the sky would be accepted. So would one of a girl in a bathing suit tracing words in the sand—a child using a typewriter (Double money, if it's a Royal Portable, and the picture is a prize winner); and so on; the list is endless.

HERE IS ALL YOU HAVE TO DO

1—Get an Entry Blank from any store where Royal Portable Typewriters are sold, or write direct to the Royal Typewriter Company, Inc.

2—Read the rules carefully.

3—Send in prints of as many different photographs as you wish with Entry Blank properly signed, so that they will arrive on or before midnight, Friday, September 2, 1938.

HERE'S WHAT HAPPENS

1—Prints will be judged on the basis of their human interest and quality. The opinion of the judges will be final.

2—All entrants will be advised of judges' decision on or before October 15, 1938.

HERE ARE THE JUDGES

Picture Editor, LIFE Magazine; Editor, MINICAM Magazine; Picture Editor, TIMES WIDE WORLD PHOTOS.

HERE'S THE KIND OF MONEY YOU WIN

$150.00 for the winning picture!
100.00 for the next best picture!
75.00 for the third best!
50.00 for the fourth prize!
25.00 for the fifth prize!
10.00 each for 25 sixth prizes!
5.00 each 70 Honorable Mentions

In case of ties, duplicate prizes will be awarded.

HOW TO DOUBLE YOUR PRIZE MONEY

All prize winning pictures will be eligible for DOUBLE PRIZE MONEY if they show a Royal Portable in use. However, they must *first be selected by judges as meriting a cash prize solely on the basis of their interest and quality.*

ENTER Royal's PHOTO CONTEST today! Anyone (not a professional, a Royal Portable dealer, an employee of Royal or its advertising agency or members of their families) who can focus a camera and snap a picture may earn one of the 100 cash prizes. Get busy and—GOOD LUCK!

REMEMBER—If unable to obtain Entry Blank from Royal Portable dealer, address: Royal Typewriter Company, Inc., Contest Dept. M-2, 2 Park Avenue, New York City

CASH AND HONORS GALORE FOR PRIZE WINNERS!

An opportunity to have your work seen by well known picture authorities. Publicity in the photographic magazines—several editors have signified their willingness to feature winners' photos with details of handling. Furthermore, all of *your* pictures used by Royal will carry your name.

ONE SURE PRIZE WINNER!

ROYAL PORTABLE DE LUXE . . . Owners say—"It's the finest portable made." Beautiful, handsome lines. Sturdy construction, built for years of usefulness. With Touch Control, Automatic Paper Lock and many other Royal improvements. Four Royal Portable models—four prices. Convenient monthly terms, if desired. See these Royals . . . Try them all at your nearest dealer's store.

ROYAL PORTABLE TYPEWRITERS

letter of criticism, and I trust you will accept this criticism in the spirit of cooperation in which it is offered.

Perhaps some day you might wish to present to your readers the story of the eye, and of its similarity to the camera.

ARTHUR BEGRER.

New York.

• Optometrist Berger is correct in dubbing the story "highly imaginative." The human retina transmits impulses to the brain, retains no image and cannot be handled like a piece of film. These points the article expressed unequivocally in its last paragraph; and it definitely was presented not as a hoax but as a fantastic conjecture worth toying with in the imagination. Additional stories of the human eye—and its similarity to the camera—will be forthcoming in future issues of MINICAM.

"It's Not So Fanciful—"

Sirs:

In . . . "If the Eye Were a Camera" . . . the article is not as fanciful as the author seemed to believe, for in a book I have before me entitled "Light for Students" by Edwin Edser, published by MacMillan, 1928, there is the following chapter:

"The Visual Purple.—In man and many animals the terminal, cylindrical portion of the rods is of a deep purple colour. The colouring matter of these rods, termed 'visual purple' may be dissolved out by appropriate chemical reagents, and a deep purple solution, which is bleached by light, is obtained. Yellowish-green light has the strongest bleaching action. It happens that the yellowish-green part of the spectrum is that which appears brightest to the living eye. Light also produces a bleaching action on the purple colouring-matter in the rods during ordinary vision; the colour becomes gradually restored in darkness. If the eye of an animal is focussed on a bright object immediately before it is killed, a bleached image of the object will be found on the retina, if the eye is not exposed to light during dissection. This image can be "fixed" by washing in a 10 per cent solution of potash alum, and an ocular photograph of the object thus obtained."

O. K. HARTER.

Pasadena, Calif.

• Of the many letters elicited by the article, "If the Eye Were a Camera," this and the previous one represent the two points of view. MINICAM is accused of being too imaginative in its treatment of the story, and too conservative. Which is right?

"No Fanfare—No Trumpets—"

Sirs:

Congratulations on a successful year, a year as the best magazine on camera technique available.

As a suggestion (not a command or a request), why not in the 12th or 13th copy publish a list of all articles for the year alphabetically arranged as to subject matter with page

numbers so we can easily find the desired article.

For the query editor I have the following questions: What are the following titles:

1. F. R. P. S. 2. A. R. P. S. 3. A. S. C.?

NELSON BECK.

Shelbyville, Ill.

- Thanks, and, yes, an index will be forthcoming for the first volume of MINICAM. It will be announced next month. The above honorar societies are (1) Fellow of the Royal Photographic Society; (2) Associate of the Royal Photographic Society, and (3) American Society of Cinematographers.

Closeup with an Argus

Sirs:

Recently, while experimenting with my versatile Argus, I made a discovery which I think should be passed on to other fans.

● Argus camera 3 inches from subject, f11, 1/25th.

By removing the front lens mount and focusing on a piece of ground glass you can get about three inches from an object. The only difficulty I encountered was that the edge of the picture was not in focus. However, by stopping the lens down to f11, and centering the object, this problem was overcome.

LEO MOLATORE.

Klamath Falls, Ore.

Man or Camel?

Sirs:

Here I am back again with another picture—this time a screwy one—which I snapped in Tibet a few years ago.

Camels are notoriously of vicious temperament and this beast had worked up a froth of rage. From the angle I took the picture, it looked like a white beard. The illusion of a man's face is just another of those things that the camera catches though it has eluded the human eye.

I look forward to MINICAM every month and I have worked up a sale for every issue that comes to the drug store where I work

a few hours a day. It's a fine magazine for the amateur—and I recommend it.

ROSE LEIBBRAND,
Heppner, Oregon.

"Worth Enduring Toothache"

Sirs:

Was introduced to MINICAM for the first time while in a dentist's waiting room and let me tell you I forgot all about that toothache. I bought my first copy that day and MINICAM at two bits has more stuff in it than any other book on the subject I've ever seen, no matter what the price. It's worth keeping for reference and re-reading for new ideas as I increase my camera experience . . . A new and exciting world has been revealed to me and my camera through MINICAM . . . Perhaps this note sounds excited but I want to tell you I would rather have a toothache than miss any issue of MINICAM.

WALTER ORBIT.
New York City.

Law and Ethics

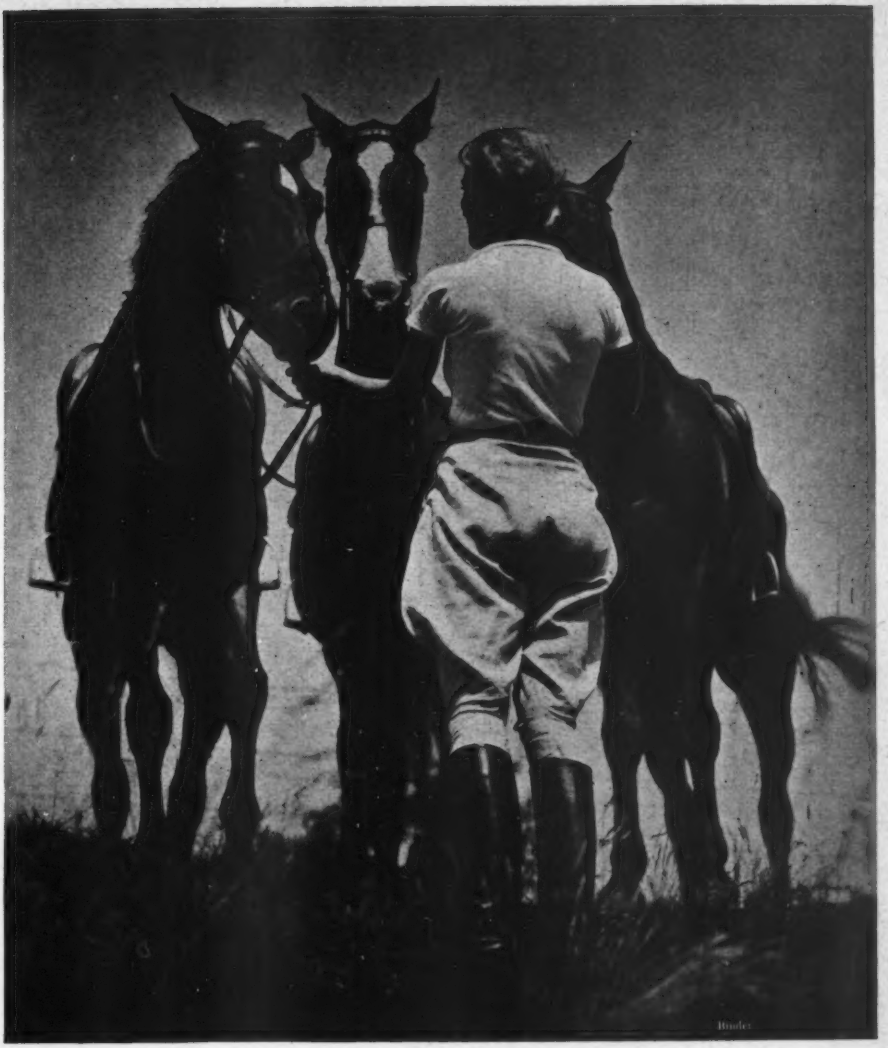
Sirs:

Your article entitled "Law for Photographers" in July MINICAM comes at a most opportune time for at least two camera fans.

On the night of June 30, 1938, we armed ourselves with flash bulbs, a Voigtlander camera, and a Speedflash synchronizer, and went in an auto to a hilltop popular with "spooners" of this town. Our motive was to take pictures of a very candid flash type for entry in an amateur contest. There was absolutely no intention of commercializing in any way on these pictures. Having a rudimentary knowledge of the law concerning publication releases and rights, we naturally would not use any shot in which the subjects were even slightly recognizable.

After taking one picture we left the spot and were followed by the party whose picture had been taken. He obtained the license number of our car and traced ownership at the local police station after placing a complaint against us. Later we were accosted, accused of being "peeping Toms" and told that if the film was not surrendered we would be arrested. A specific charge was not mentioned at that time.

At first we defied the individual, telling him that we felt we were completely within our rights. Our manner was at no time antagonistic, merely firm as we sincerely believed in the fact that no law or ordinance had been broken. During the day following, however, one of us, who had driven the car when the picture was taken, was called to the police station for questioning. In the course of the proceedings here, the car driver was told that action was being taken to suspend his license because of "Operation of a Motor Vehicle for an Improper Purpose." It was further threatened that unless the film was turned over to the party who had been photographed, there was liability of a charge being pressed against us by the photographed party for *disturbing the peace!* As the idea of the matter being taken to court loomed before us, we felt that perhaps we were sadly at wrong on the legal end. Our



Your vacation picture taking will surely be successful and a real photographic pleasure if you carry along plenty of GEVAERT Films in your kit. They are supplied in Roll Films, Film Packs which fit all popular sizes of cameras and provide every quality demanded by modern photographers. For the miniature enthusiast there is 35mm film packed in refillable cartridges (36 exposures) and for those who prefer a shorter length, an 18 exposure roll. With Gevaert Films your vacation photography will be a distinct revelation.

Say **Gevaert** for **perfect pictures**

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straits would not permit a case to see whether or not we were right so to clear things up the undeveloped film was turned over to the person who entered the complaint.

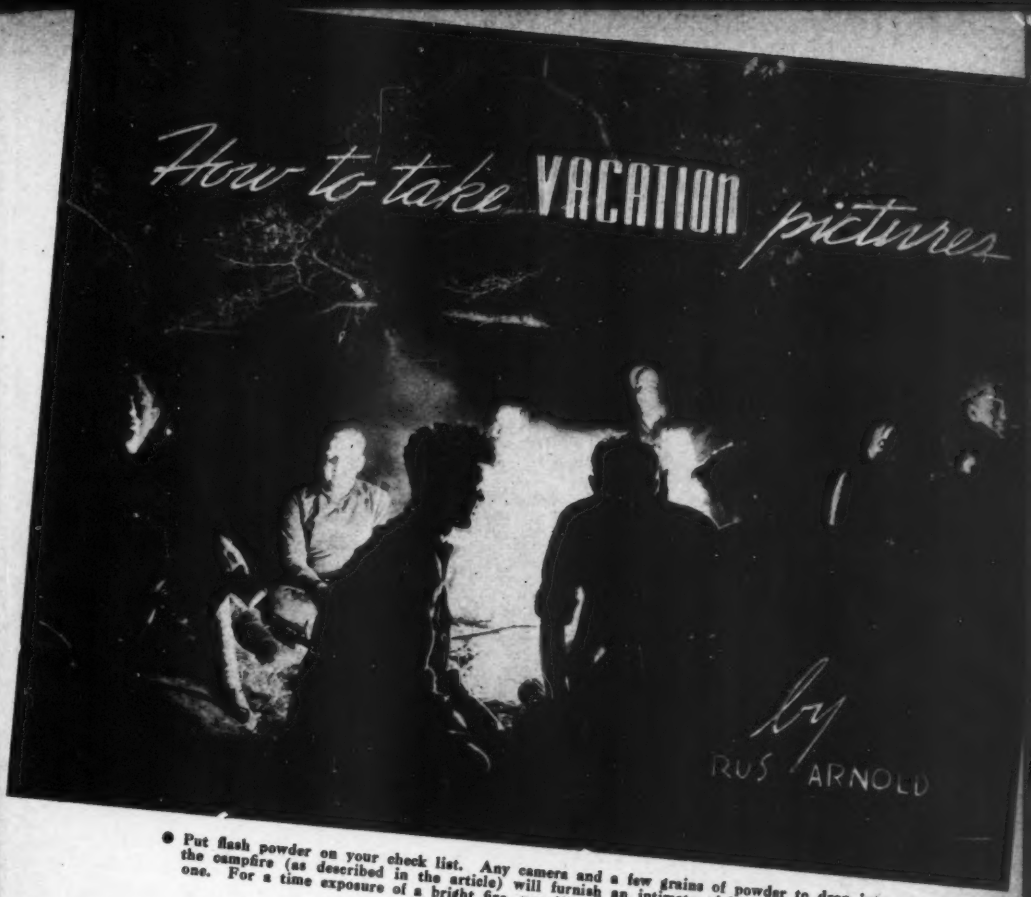
Later it occurred to us that perhaps we were in the right and that we had been browbeaten or bullied into giving up the film. Two local lawyers were consulted, a police captain in a city nearby and the Sergeant of police in a neighboring town were also visited and questioned by us. The sum total of these various opinions was that we were unquestionably *right!*

This matter is a closed issue for us in our present financial position, but we thought it might offer a lesson for fellow MINICAM readers and users.

W. L. BIGGART, JR.
G. W. RAMEY.

Needham, Mass.

• A relic of the candid camera's barbarous infancy, this stunt might be justified legally only if the photographer's result was news and a matter of public interest. Equally important is the ethical standpoint, the key to which often is obtainable by asking, "How would I feel if someone did it to me?" The ethics of the modern lensman include not only "getting his picture," but doing it without arousing antagonism. To ebullient, ubiquitous minicam fans Ramey and Biggart, Jr., your editor advises no intruding—with or without camera. For second "Law for Photographers" article, see page 49.



● Put flash powder on your check list. Any camera and a few grains of powder to drop into the campfire (as described in the article) will furnish an intimate night snapshot like this one. For a time exposure of a bright fire, use f4.5 at 1 second.

Fig. 1.

Up-to-date summer ideas and information. See also the article, "Hot Weather Hints," page 45.

THERE we were, without a camera, at Xochimilco, Mexico's pictorial paradise. Wherever we turned, we saw picture possibilities. Local color? . . .narrow-streeted village and dugout canoes over-flowing with flowers. Landscapes? . . . tall, proud poplars against a cloud-embroidered sky. Water scenes? . . . endless curves and twists of the canals in this floating garden of the sub-tropics. Genre? . . . the enchilada-woman and her charcoal stove in a tiny canoe; the tin-type photographer in his rowboat; the floating minstrels who tie up to your boat and serenade you for a 10 centavos.

A flatboat, gaily bedecked with flowers, pulled ashore. One of the party of half-a-dozen tourists jumped ashore, pulling the lens into place on his high-calibre minicam.

What was he so anxious to shoot? Ah—that lovely little Indian peasant girl, arms full of bright flowers, "*Flores,* meester, please? Only five centavos?"

"Don't bother me," he snapped. "Get out of my way."

Then pointing his camera at his friends, he called out, "All right, now hold steady, please, and SMILE!" Click, and another piece of perfectly good film went the way of 99 and 44/100 per cent of all film on vacation trips. Another picture of Frank, Aunt Mabel, and Junior, squinting-grinning at the camera.

When *you* get back from your vacation,

RACE YOU! WILLIAM RITTASE

● Bathers running into or out of the water are easy subjects to "pose," and can be shot, when they are coming straight at you, as slow as 1/50th second. In the above, camera was held low to get the wide expanse of sky. Note that girl has both feet off the ground. Pan film, 1/200th second, at f4.5, medium yellow filter. Fig. 2.

what will *you* have to show for it: pictures of your companions sprawled all over the horizon, or a complete, effective, and stirring pictorial record of your holiday? That depends largely on how you plan your vacation. Map out your photography as carefully as your itinerary—yes, and writing it out will help.

The first step is to prepare a list of what you want to take along. It might look something like the list printed with this article.

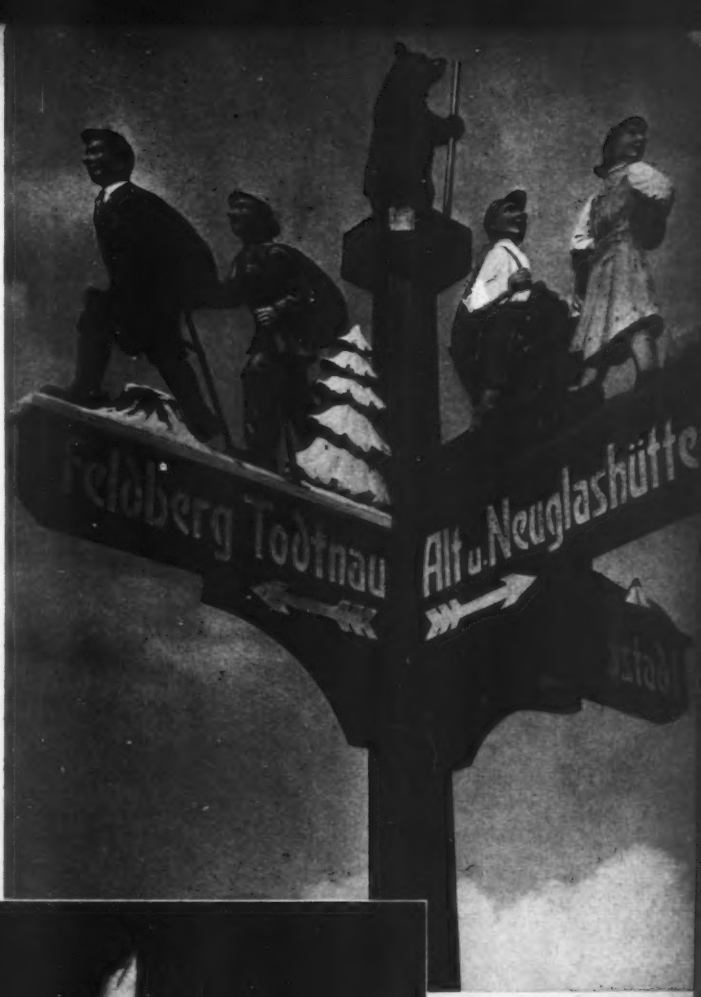
Step two calls for a list of the pictures to take. Write a brief "shooting script" in advance. It will save missing those details necessary to create a complete picture story of your holiday. Go over this script from time to time during your vacation, and amplify it.

Right at this point get out last year's vacation pictures, look them over, and make up a list of the things you shouldn't have done, and especially *the things you forgot to do.* It will also help to make a list of the types

● A good vacation-picture formula: a girl, a boat, and sunset. Back-lighting idealizes the girl. Shooting close-up, the photographer leaves half the canoe to your imagination so you can put yourself on the other seat, camera in hand and romance in your heart. Contax, 1/100th second, f11, S.S. Pan film. By making a dark print ("over-printing") it is easy to create "moonlight" scenes in sunlight. Fig. 3

J. JULIUS FANTA

of pictures you want to get, and how to treat them to avoid last year's failures. Printed elsewhere is a typical "Check List" of things to shoot. Let's consider how some of these pictures will be handled. While doing this, have your own vacation pictures before you, and see how these things apply to your suc-



● **Signs help to recall the feeling and the flavor of never - to - be - forgotten places. Shoot plenty of them. This one was taken with a Rolleiflex, 1/50th at f8. Fig. 4.**

PRINCESS E. VON ARENBERG

● **And don't shoot only faces. Interesting and unusual compositions and humorous situations await the alert cameraman. Ortho film, 1/40th at f9. Fig. 5.**

ANDRE DIENES

cesses and failures of last year.

PORTRAITS: should be portraits and not pictures of human flies atop a far-off mountain or a snap of seven people lined up as if before a firing - squad. Get closer. Avoid direct, contrasty sunlight. (Reread Frank Randt's article

on outdoor portraiture in July MINICAM). Wherever possible, instead of just a portrait of Aunt Mabel smiling, get Aunt Mabel pulling in a prize tuna. Or better still, vice versa.

Consider how much more interesting is Fig. 6 than the average vacation snapshot of the girl-friend. Even Fig. 8 is the sort of thing you will treasure, what though you've already seen 7,051 just like it. Fig. 3 idealizes the girl-friend by setting her against a halo of back-lighting that looks like the moon.

MOONLIGHT SCENES: are most easily taken during the day. Expose for the sky and print dark. The "moon" is

● When the subject matter is not unusual nor the pose, that is when "angle" can come to the rescue. The camera was not only brought down for a "worm's eye" view, but also tilted. Note the foreshortening of the girl's legs, making her look like a giant, and the sloping horizon. Exposure f8, 1/100th, Panatomic film, light yellow filter. The sky was darkened by dodging the print.
Fig. 6.
ROBERT KENNETH WEITZEN

really the sun behind a thin cloud. A safer procedure is to shoot with the sun located just outside the picture, with a good lens-shade on the camera.

ANIMALS: use a long-focus lens if you have one; a single deer is usually a better picture than a herd. Shoot wide open for speed and to keep the background out of focus. With caged animals, try to shoot with the lens pushed through the fence so the animal seems to be at large.

FLOWERS: Use a tripod if possible and wait for the breeze to stop. Pan film, yellow filter, for most colors. Read the article "Why Filters?" in this issue. Use a long-focus lens or portrait attachment, and shoot at the angle at which the flower is usually seen. Single blossoms make good pictures, especially with delicate backlighting and soft treatment. Flower beds usually disappoint, especially as backgrounds for portraits. They become annoying masses of black and white spots.

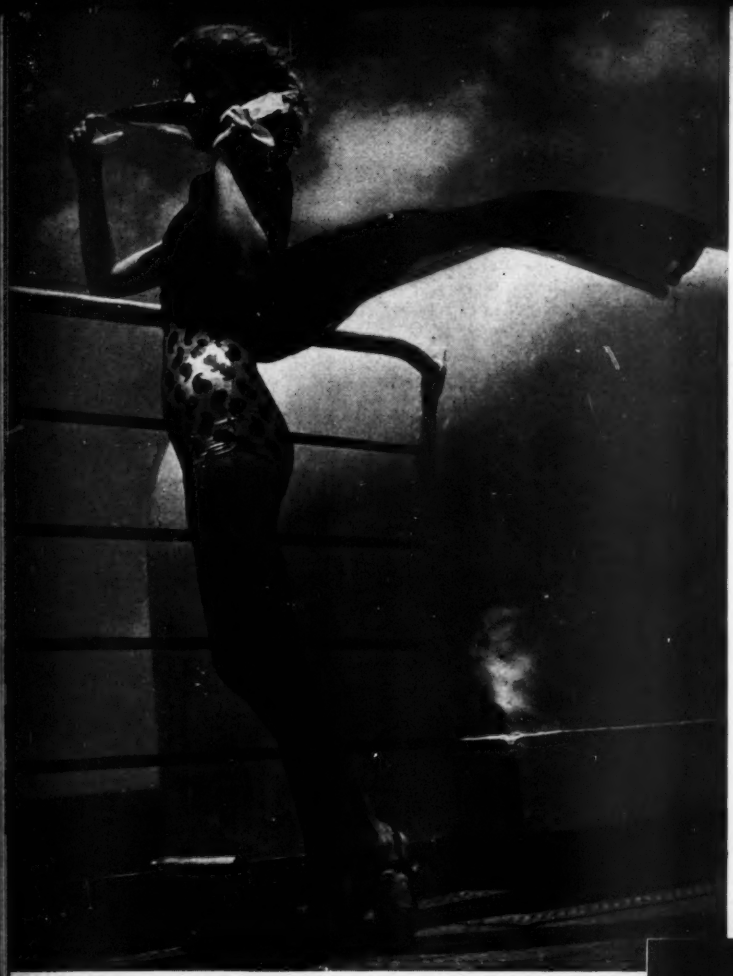
MOUNTAIN SCENES: Don't waste film on "vistas" of unbroken terrain from the top of a mountain. A figure in the foreground, or a gnarled, weather-beaten tree, silhouetted against red-filtered clouds,

ERNO VADAS

● A lovely pictorial treatment of an ordinary subject. The combination of viewpoint, lighting, and placing of subject matter makes a prize shot. Note the diagonal of the road, and the balancing of a large group near the center by a small church far off on the opposite side, illustrating the "lever" theory of composition. Fig. 7.

will make better use of your film. Try framing the view between two trees, and use only enough landscape to balance the sky.

Fig. 7 is a beautiful mountain scene. The photographer has made effective use of back-lighting to keep the trees from running together into a solid gray mass. The road carries the eye back to the church from which the pilgrims are marching. Note how the high viewpoint makes the steepness of the road apparent. You will never get the "feel" of a steep



AT SEA KARGER-PIX

● Aboard ship, line up your subject at the rail, if you must, but let her ignore the camera, as above, and do something, even play with a bandana. Don't neglect to ask the tropical breeze to waft a veil. Fig. 8.

● Silhouettes are summer subjects not to be overlooked. Expose for the sky and get the clouds. To avoid an empty, "bald" sky, use a yellow filter, or a yellow-green one if your film is panchromatic. Fig. 9.

CARLTON GROAT

road or a tough climb by shooting up at it as most people do. A high viewpoint is needed.

PICTURES EN ROUTE: You will want to show what your trip was like. Fig. 4 and Fig. 7 fit into this class.

CLOSE-UPS: Whatever you shoot, try another shot closer up. Get long and medium shots, but above all get plenty of close-ups. You might take a general view of a pond with people around it, then a medium close-up like Fig. 5. You might then get closer still, and get the expression on a youngster's bright face as his boat tacks in the breeze. A picture of a group of people at archery games is not half as interesting as a close-up of a pair of sun-browned arms pulling all-the-way-

back on a stout bow, with muscles and bow-string quivering with tension.

CAMP-FIRE SHOTS: should be taken by the light of the fire. Fast lenses and fast film will usually be adequate, but are not necessary. Figure 1 was taken with a few grains of flash-powder wrapped in tissue paper (at a safe distance from the fire!) and tossed into the flames after the shutter had been opened. The camera was on a tripod, with shutter set on "bulb." The same effect could have been obtained with a photoflash-synchronizer by using an extension cord and concealing the bulb near the fireplace. As with sunset and "fake-moonlight" pictures, the direct light should be shielded from the lens. A camper, silhouetted against the fire, does this, and adds to the effectiveness of the picture.

Just one thing more. Your vacation picture-taking, which should have started long before your vacation, in preparations and planning, should not end when you unpack your bags at home. Instead of dumping your prints into a cigar box, mount them into a neat album, arranged either in chronological order, or according to subject matter. A good series of vacation pictures deserves careful assembly into an album in the manner of the modern photographic annual. This can be made using uniform sheets of enlarging (or contact) paper, either 8x10 or 11x14, instead of ordinary album leaves.

Keep this idea in mind while shooting your vacation pictures, and you will not overlook important subject matter. Plan your layouts so you will know what photographs you need.

Suppose you have five pictures of the campfire: chopping the wood, stacking it, lighting the fire, toasting marshmallows, and a pictorial view of the group around the fire, the first two taken by daylight, the second two by photoflash, the fifth by firelight. You might plan to have the pictorial view, about 4 x 5 inches, in the middle, with the other four, about 2 x 3 inches each, at the four corners, overlapping the center print. By careful masking the five negatives are enlarged onto the one sheet—and there's an album page.

A photographic cover, mounted on cardboard, with title hand-lettered on the print, lends a professional-looking finishing touch. You might write the title of your album on the sand with sea-shells, then photograph it. Your own shadow, camera-in-hand, sprawled across the lettering on the sand, lends further meaning to the picture. Put the album on your library table, and you have your vacation preserved so you can always bring it back to mind.

But maybe we're running ahead too fast. Right now the important thing is to

● Don't overlook possibilities for candid shots. A snapshot may become an excellent composition as a result of the arrangement of simple details such as a dock, water and subjects lounging in the vicinity. Fig. 10.

CANDID

JOHN W. SHEERES

plan your vacation pictures carefully in advance. Take along plenty of film, shoot plenty of pictures, and read the brief article "Hot weather tips" in this issue.

Before You Shoot—Remember!

CORRECT FOCUS: Adjust lens opening, shutter speed and focus for distance to center of interest.

STEADY CAMERA: Use tripod, table, or other firm support wherever possible for exposures 1/50th second or slower. If camera is hand held, lean against tree, etc. Take deep breath, watch subject, press shutter, exhale. Many pictures spoiled by imperfectly held camera.

FRAMING: Study the picture carefully in the finder. Make sure everything is in that belongs in, nothing that doesn't belong in.

FOREGROUND: See that foreground has no disturbing blurred elements, like overlarge feet, moving twigs, or out-of-focus heads. It should "lead into" the picture (a winding road) or "frame it" (an arched doorway).

BACKGROUND: Avoid confusing backgrounds, like a tree sprouting from Aunt Mabel's head, or a bright-patterned wall back of Junior. (Read "Backgrounds to the Fore" in April MINICAM).

CENTER OF INTEREST: Try to get your subject matter in a pleasing arrangement, and not in the center of the picture.

FILM-WINDING: Get into the habit of winding film AT ONCE after exposure.

ANGLE: Try another shot from a slightly different angle. Whatever film may cost, it is cheaper than the remorse at a picture that didn't quite get the right slant.

HOLLYWOOD TECHNIQUE: On a screen you usually see a situation presented first from a distance. Then the camera moves in for a medium shot, and then for close-ups. Take each vacation picture at various distances. Above all, take plenty of *close-ups!*

POSING: Get the expression, then shoot quickly. Avoid having your subjects look at the camera or otherwise acknowledge its presence. Have your subject look "into" the picture (toward the center) instead of "out of" it.

Check List of Vacation Equipment

CAMERA: In carrying case. If it's a new one, try it out before you leave.

EXPOSURE METER: You may be running into unfamiliar light values. Exposure calculator or tables.

SUPPLEMENTARY LENSES: for Close-ups, etc. See article in this issue.

FILTERS: Most important, medium yellow for cloud effects. See article in this issue.

NOTE-BOOK: To record exposures.

FILM: Lots of chrome-type for most outdoor shots, to get brilliance and finer grain. Some normal-speed pan to be used where color correction is needed, or by artificial light. A few rolls of high-speed pan for church-interiors or other dimly-lit places. Be sure you take along plenty of your favorite film or you might have to get a film you're not used to. For ocean trips, get tropical packing. With plate-back cameras you may prefer cut-film at home, but film-pack is less bulky, easier to reload, and more easily obtainable on trips.

TRIPOD: Light, sturdy, preferably wood. Good tilting top.

FLOOD BULBS: Two or three take little room, come in handy. If you are going to stay in one place, take along a pair of clamp-on reflectors as well. Cardboard reflectors are obtainable at any Eastman store. Most dealers carry floods, even in small towns.

FLASH BULBS: The new small sizes are ideal for vacation shots indoors. If camping, take a half-ounce of flash-powder; safer still, the prepared long-fuse flash cartridges.

FLASH SYNCHRONIZERS: If you've ever used one, you wouldn't dream of leaving it home. But put in fresh batteries first and have it checked for synchronization. "Open flash" otherwise can be used.

DEVELOPING AND PRINTING EQUIPMENT: (if needed). See article, "Hot Weather Hints," page 45.

VACATION SUBJECTS
Check List of Pictures to Take

PORTRAITS: Your companions, the people you visit, local "types." Get them doing things.

ACTION SHOTS: Your train, plane, boat, or car. Fish and fisherman. Bathers. Sports. Animals.

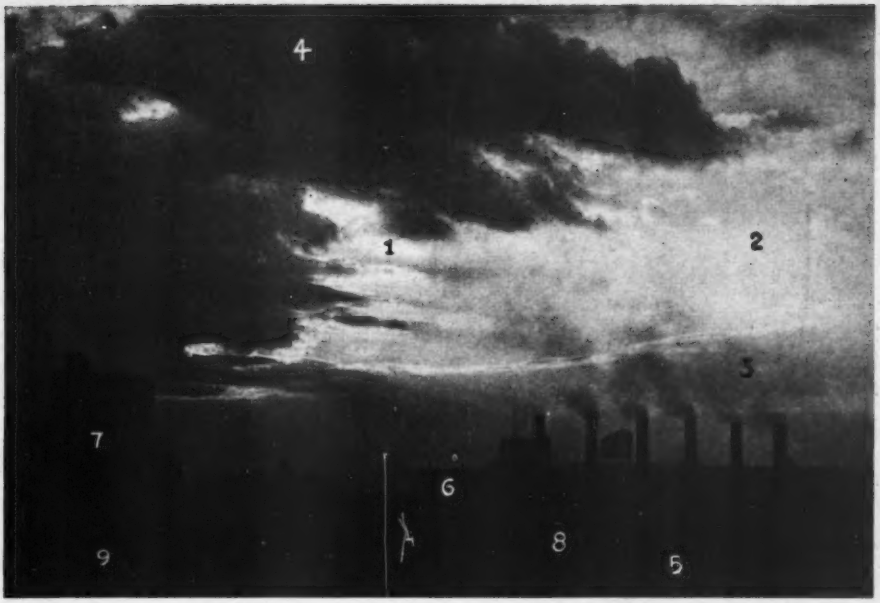
NIGHT SHOTS: Eating by the light of your auto headlamps. The village roller-skating rink. The lawn-party at night. Lightning over the social hall. The campfire.

MOONLIGHT SCENES: Canoeing. On board ship. The wake of the vessel. The lake from your cabin window.

ANIMALS: Domestic (chickens, cows, dogs, horses). Wild (deer, snakes, turtles, squirrels, birds).

BOATS: In action or at anchor. On large boats, shoot closeups; a sail filled with

(*Page* 75, *please*)



● The numbers in the above print refer to corresponding tones of grey in the step wedge below. The normal eye can identify perhaps a thousand gradations of tone; a good negative may reproduce several hundred; but in a photographic print, the discernable tone scale is limited to about 50 to 1. Fig. 1

WHAT IS TONE?

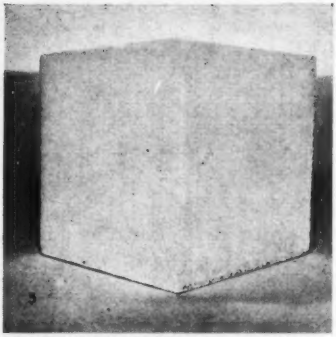
● A step wedge placed directly on a print, will aid the identification of tones and permit comparison with the appearance of natural scenes. How to do it, is explained in the article. Fig. 2

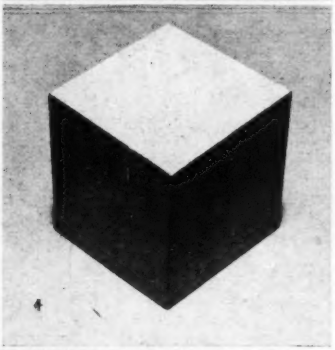
The first step in successful photography is SEEING in terms of grey. View prints in terms of tone—and evaluate the various areas in relation to each other.

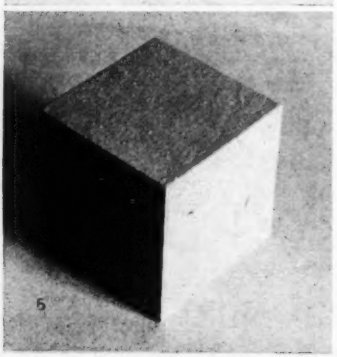
By JACOB DESCHIN
Illustrated by the Author

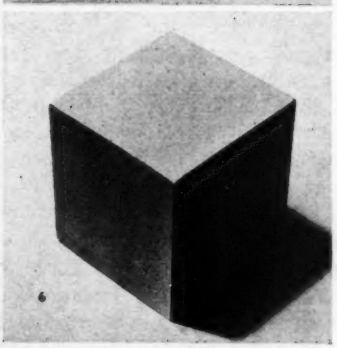
TONES in photography exist by the grace of light. Without light we could see no tones, that is, we could see nothing; with too much light we would see no tones, nothing but a glare—the white paper of a print. The moment light is introduced, even though it be so weak as to permit only slight visibility of an object or objects, that moment tone is born and will increase in brightness with every increase in the intensity of the light. Similarly with a glare; soon after the light intensity is cut down or its direction altered, we begin to distinguish tonality and to see objects that fomerly "blinded" us by the intense glare of raw light. A photographer reproduces nature by means of various shades of grey.

Under normal lighting conditions the human eye can distinguish a great many









different tones. This number cannot possibly be recorded by the film, and a paper print cuts the number of discernable tones down still further to a total of only 50 to 1 at best.

For the sake of convenience, tones in photography are classified in three general groups, namely, highlights, middle tones and shadows. Most photographs contain all three, although special lighting arrangements may *apparently* cut these down to only highlights and middle tones, as in "high key" lighting, or highlights and shadows, as in bold contrast subjects. Actually, however, a careful scrutiny of such pictures will reveal a brightest and a darkest tone, with other tones, however delicate, lying between the two extremes.

"Highlight" is the term used to denote one of the brightest areas or points in an illuminated subject. In other words, highlights refer to those areas that reflect the greatest amount of the light falling on the subject. A classic instance of a highlight is a "catchlight" in the eye ball, which is the reflection of the light source used to illuminate the subject. Another familiar instance is found in the sparkles of light on sunlit water. These, however, constitute only one type of highlight, so-called "opaque" highlights because they do not show detail but are revealed in a print as white points of "white paper."

There are also so-called "transparent" highlights, bright areas in which detail is seen. Such areas may be found in a white dress, in brightly lighted hair, in a white or light-toned wall, in clouds, and many other areas of a subject from which the light reflects more strongly than from other parts of the subject. We may, therefore, have in the same subject both opaque and transparent areas and both may legitimately be called highlights even when appearing in the same subject.

At the other end of the scale we have what are known as shadows. This term, too, is self-explanatory, and may range anywhere from abso-

- **Fig. 3, top, shows a cube lighted evenly to show only one tone. This gives a relatively flat appearance to the object. The depth of tone may be classified as approximately number 2 of the step wedge on the previous page.**
- **Fig. 4 shows the same cube lighted for two tones. The top surface is high-lit for tone number 1, and the other surfaces are in tone number 5, a dark-intermediate or shadow tone.**
- **Fig. 5. The cube is here lighted for three distinct tones, a number 1 highlight tone; a number 3 intermediate tone on the top of the cube; and a shadow tone.**
- **Fig. 6. The tones are approximately the same as in Fig. 5 except that the cast shadow is darker and thus illustrates a fourth tone.**

lute black in which practically no detail at all is seen to relatively dark areas in which detail is seen rather clearly. However, because the light reflections from these areas are so very weak as compared with the highlights, we call them shadows.

Between these extremes of highlights and shadows lie a great many intermediate tones, and these are called middle tones. The greater the number of perceptible middle tones, and these may be achieved with proper lighting, the more faithfully is the form and shape of the subject represented.

The importance of tone in modelling is illustrated in Fig. 11 when compared with Figs. 7, 8, 9 and 10.

In Fig. 1, a simple landscape subject has been roughly classified as to tones. In the process of reproduction, some of the darker shades have "melted" together so they are not readily distinguishable, and even in the step wedge, Fig. 2, the tones marked 6, 7 and 8 appear almost the same.

The step wedge may be placed next to an area in a photograph for exact comparison of tone values.

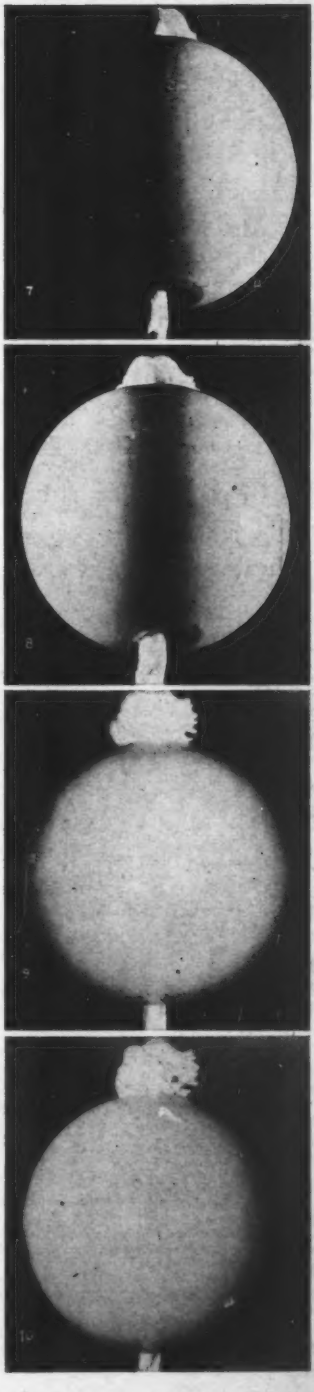
Tones comparable to tone band "1" may be classified as high lights. Tones comparable to the upper steps, bands "6" to "9", would be shadow areas. The middle tones are steps "2" to "5".

Learn to look at a scene and evaluate its brightness as the film will see it in terms of gray tones.

A full scale print has white high lights, dark shadows, and a wealth of intermediate gradations or middle tones.

To show the various methods by which tones can be created and controlled with light, let's light up a cube and a sphere. These objects contain planes and curves, surfaces that characterize most subjects.

Fig. 3 shows a cube lighted to show only one tone. Had the light been stronger or the negative under-printed it might have appeared like a flat surface without shape or form. Theoretically, a single tone will give a flat appearance to an object, and the light could have been so manipulated that this could have been achieved. However, visually, the form could still be perceived, even though the film



- Fig. 7, top, shows a sphere lighted from the side to show gradation in tonality. As the light extends around the curve it changes gradually from the brilliant high light to a deep shadow.
- Fig. 8. A second light has been placed on the other side. The result is a shadow in the center, not very effective lighting.
- Fig. 9. Use of a single front light here destroys most of the tone gradation and results in a flat area. There is gradation, however, around the sphere caused by the darker tones of the outline. This was obtained by placing the light closer to the sphere than the camera. Thus the camera sees more of the sphere then the light illuminates and the result is the dark outline.
- Fig. 10. The same as Fig. 9 except that the light is somewhat off center and the gradation of tone from light to dark are quite complete in the arc of light to shadow along the light side of the sphere.

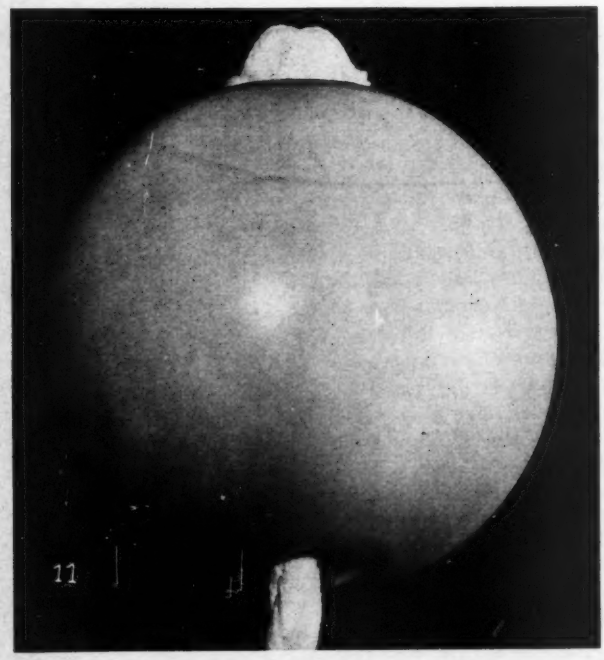
emulsion might not be able to duplicate the tone-separation sensitivity of the human eye. The lighting in this case was from the front and angled somewhat to cover all three planes equally to achieve a so-called monotone or single tone.

Fig. 4 illustrates lighting for two tones in the cube. The light is directly overhead, giving a "whitewash" result for the top plane and acutely angled illumination for the two other visible planes.

Three tones are shown in Fig. 5 cube. Here the light was directed from one side, as may be seen from the fact that one side of the cube has the same "white wash" effect seen in the top plane in Fig. 4. Another tell-tale hint of the direction and placement of the light is found in the long shadow. Unmistakably three distinct tones are seen in Fig. 5, the tone of each plane being considerably different from the others.

Four tones are seen in Fig. 6, the fourth tone being occasioned by the deep shadow at the base of the darkest plane of the cube. The light here again, as in Fig 2, is overhead but placed somewhat to one side, resulting in one of the side planes being darker than the other and creating the "creeping" shadow on the dark plane.

The lighting of the sphere called for a somewhat different technique and occasioned more care in manipulation of light than that required for the cube. In Fig. 7 the light is from the side. Only one-half of the sphere (a bath ball, by the way) is lighted, the other half being entirely unlighted. Notice, however, that because of the spherical character of the object, there is a gradation in tonality as the light is moved around the curve.



● The sphere adequately lighted to show roundness. Note the gradations of tone throughout, varying from light to dark. This illustrates how the rendering of tones furnishes modelling. This is of prime importance in portraiture and in photographing the human figure. The effect was obtained above by the use of "unbalanced" lighting—two photofloods at unequal distances. Note that all of the nine tones numbered in the step wedge, and many intermediate tones, are represented in the above sphere without definite breaks between tone contrasts.

Fig. 11

Fig. 8 shows the fallacy of placing a second light on the other side in order to complete the lighting of the sphere. The result is a shadow in the center.

In Fig. 9, a single front light was employed, resulting in flatness. However, since the object is spherical, the day is partly saved by the fact that the illumination tapers into somewhat darker areas at the "bends".

In Fig. 10 we try to solve our problem of lighting the sphere by using one light somewhat off center. The result is still far from satisfactory and flatness with a narrow black band at one side is our poor reward.

Fig. 11 gives a more successful impression of

(*Page 78, please*)

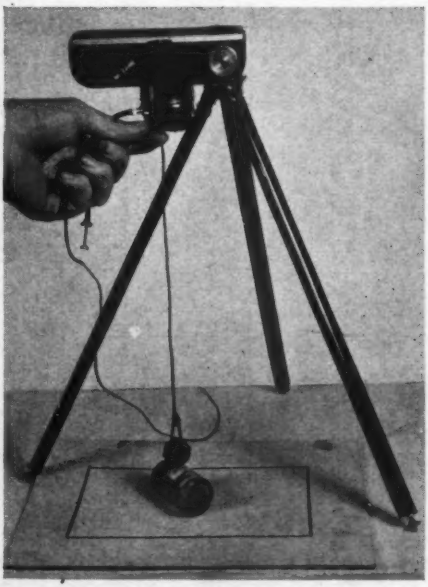
CLOSEUP LENSES

How to use a "portrait attachment," or ordinary spectacle lens for copying, table-top scenes and dramatic closeup portraits.

By ARTHUR W. LAMBERT, JR.

WE are all familiar with the "portrait attachment"—a supplementary lens to fit on the regular lens and bring us closer to the subject.

Few, however, realize that ordinary ten-cent spectacles can do the work. What is more, by using spectacle lenses of varying size, the entire field of closeups, copying, portraiture and miniature table top scenes is brought within reach of the humblest camera.



● For copying do not use the camera viewfinder, but center the lens above the copy subject by means of a plumb line or a weight on the end of a string. Fig. 2.

● The supplementary lens may be held in front of the regular lens in a filter holder or taped on with Scotch tape as shown above. Fig. 1.

Simply to set the camera lens at infinity, attach the spectacle lens with a piece of adhesive or Scotch tape, and take a picture.

The writer has a collection of spectacle lenses that he has used for years for copying. These were obtained from the black rubber "horn rimmed" eyeglasses sold by dime stores throughout the country.

Each pair of spectacles, of course, will furnish two single lenses. They may be left together, but for convenience they can be cut apart, leaving the hinge-lugs in place.

As a rule, each pair of spectacles is marked with a small round "rating sticker" on each lens, such as,

The +1.25 refers to the "power" of the lens in *diopters,* a term familiar to opticians. The lower figure refers to the equivalent focal-length of the lens in inches. It is this figure that we are interested in.

The writer uses a set of five supplemental lenses. One of these is an ordinary 10-cent magnifying glass. Its focal length is 6 inches. Rubber rimmed, it is about 1½ inches in diameter, about the same size as the spectacle lenses. The

other four lenses were taken from spectacles, as mentioned, and are as follows:

FOCAL LENGTH OF SUPPLEMENTARY LENSES

Inches (approx.)	Diopters
8	+5.00
12	+3.25
16	+2.50
32	+1.25

Note that these are "plus" lenses. The value in diopters is obtained by dividing 39.37 (the length of a meter in inches) by the focal length in inches.

Although the focal-lengths of such lenses always are marked, it is easy to check them. This also applies to finding the focal-length of a magnifying glass, which is not marked.

There is a very simple way to determine focal length. If the sun is shining, use the lens like a burning glass and measure the distance from glass to the point at which the sun's rays focus. This is the focal length of that particular lens for all practical purposes.

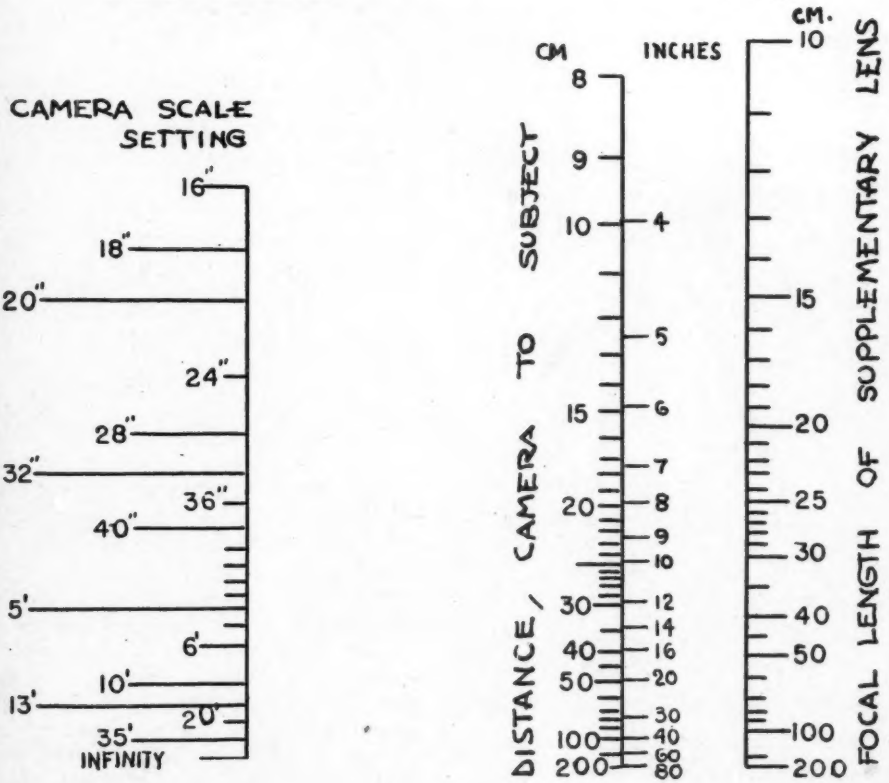
Care must be taken, however, to avoid glasses with special prescriptions that correct for astigmatism. Such glasses, if given the sun test, however, will not bring the sun to a small round focus.

With the assortment of lenses listed any job of copying can be done with any camera. The procedure is as follows:

(1) Set the camera lens to its *infinity* focus.

(2) Hold or fasten the supplemental lens to be used in front of the

● When visual focusing by means of a ground glass is not desired, this table will furnish the following data: (1) setting for distance scale on camera; (2) distance from subject to camera, or (3) focal length of supplementary lens to be used. When two of the above three factors are known, the third is found by drawing a line connecting the two known figures. For example, with a supplementary lens of 45 centimeter focal length; and camera scale set at 3 ft., what should be the distance from camera to subject? Lay a straight-edge across the table connecting the above figures and the line will run intersect the center column at 30 cm. (approximately 12 inches)—the correct distance from camera to subject. For this, the size of camera lens is immaterial. Fig. 3.



main lens, taking care to center it properly.

(3) Hold the object or copy at a distance in front of the lens equal to supplementary lens's focal-length.

(4) Expose the film.

For greater accuracy and versatility, visual focusing is used. Visual focusing with supplementary lenses is one of the advantages of cameras of the reflex type or cameras equipped with a ground glass viewing screen. With other cameras, if the back is removable, a ground glass can readily be improvised.

Let us say, for example, that you buy a "portrait attachment" at your photo supply store. Or perhaps you have a pair of discarded spectacles. If you purchase a pair in the dime store obtain plain spherical lenses—avoid glasses with special prescriptions for astigmatism.

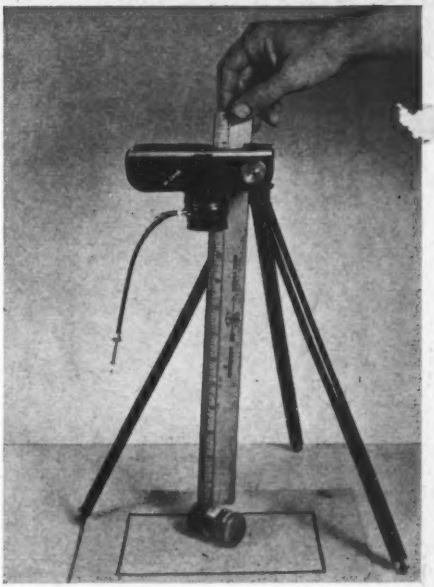
Take your new lens home and clear off the top of a table and near one end stand erect a book with an intricate and contrasty cover design. Remove the back from the camera and stretch tightly across the opening of the bellows, in the plane where the film ordinarily lies, a piece of tissue paper, or purchase a piece of ground glass of suitable size for your camera. If ground glass is not available, there are possible substitutes. A ground glass may be made from a piece of ordinary window glass by rubbing off one side with the edge of a carborundum stone or other abrasive.

"Ground glass substitute" obtainable in photo supply stores, can be applied directly on the glass. To make your own, dissolve 120 grains white wax in 1 oz. ether.

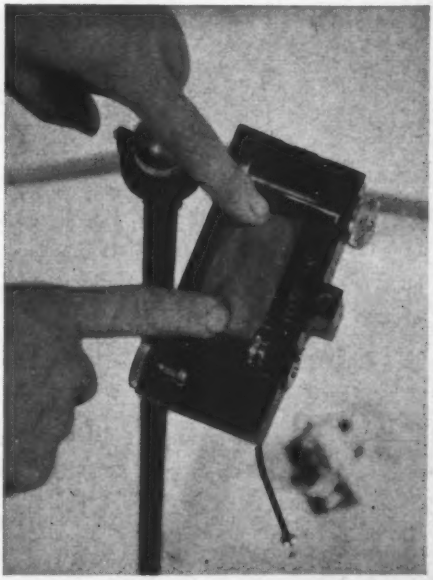
Paraffin wax paper also will serve as a ground glass. It may be used directly or first applied to a piece of glass by mean of a warm flat iron.

Fit the new lens over the front of your regular lens, which at this time should be set at infinity. Have a strong light fall on the face of the book-cover nearest the camera and a dark cloth to cover your head and the camera back, like a focus-

(*Page* 72, *please*)



● Measuring distance from camera to lens with a straight-edge. The focal center of a camera objective usually is in the plane of the iris diaphram and distance should be measured from this point. Fig. 4.



● When the back of a camera is removable, the image may be focused as shown here on a piece of tissue paper or other improvised "ground glass." This is the most accurate way as it not only shows when image is sharp but also indicates the exact field being covered. It then is not necessary to use the table (Fig. 3) except to get a general idea of distances and lenses to be used. Fig. 5.

PHOTO - PATTERNS

BY

THURMAN ROTAN

Illustrated by the Author

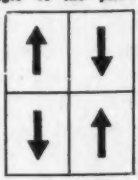
WHO hasn't looked through a file of negatives and asked, "What next?" An ordinarily uninteresting negative often may be used to create a decorative and intriguing photo pattern. The photo pattern may be mounted like a pictorial print or may be used for a book cover, wall mural, etc.

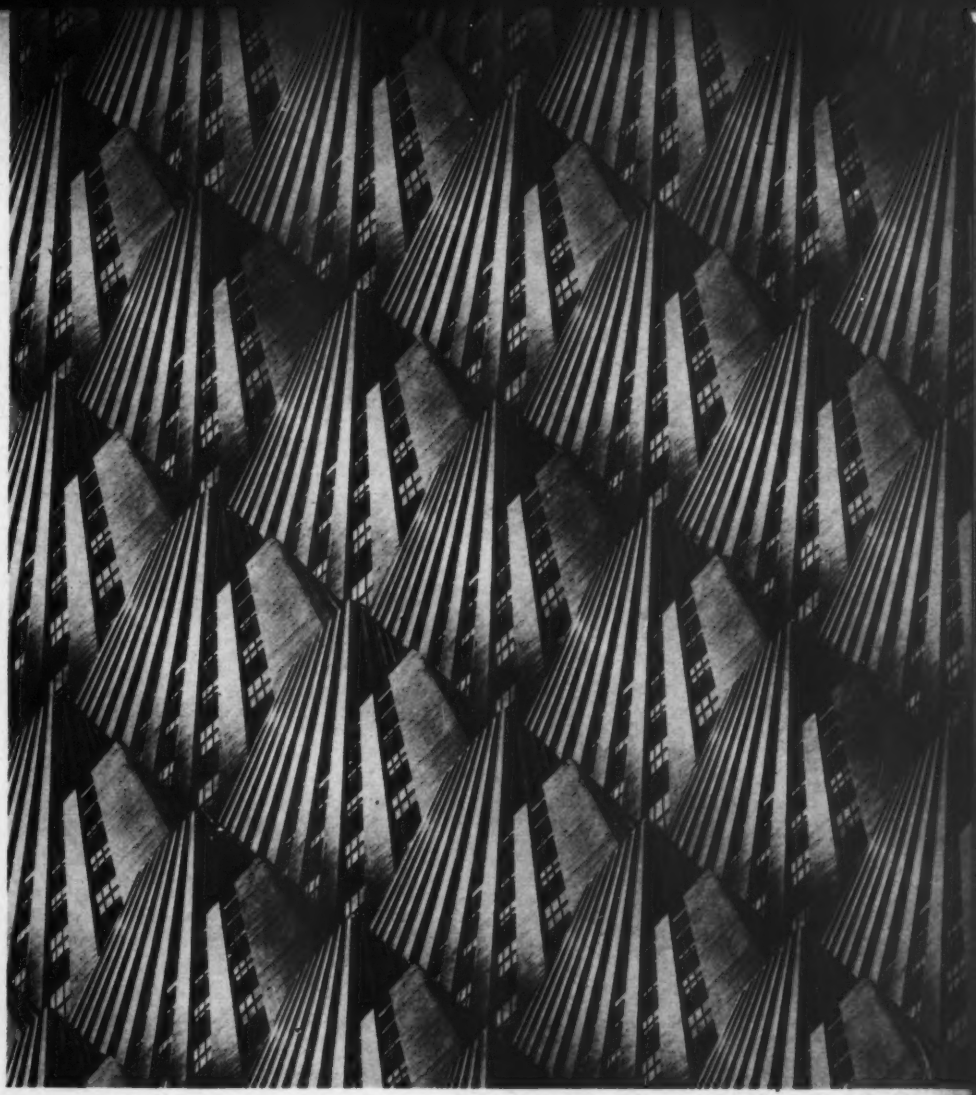
An entirely new composition is created merely by pasting together a dozen or more prints of one subject.

The first problem is choice of subject-matter. Select subjects with a diagonal composition. Views with a strong horizon line, or heavy verticals do not lend themselves to the photo pattern process.

If there are a number of negatives to choose from, several prints of each negative may be made. Experiment by cropping and arranging each group of prints until the most pleasing effect is attained. The final photo pattern will be composed of prints from one negative. However, reversed prints, or prints made with the negative turned over may be used. Two of the photo patterns shown here were

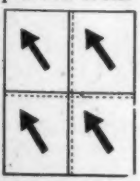
● For this photo-pattern, 16 prints were arranged as in the diagram below. The subject—a weather-beaten pile surrounded by sea shells — is shown above, before it was cropped to increase the angle of the pile's diagonal. Photographs whose compositions emphasize strong horizontal or vertical lines do not lend themselves to photo pattern making. The desired photographs have diagonal compositions.





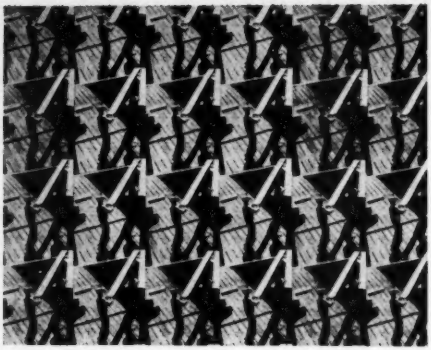
● About three dozen prints were made for the above and trimmed along the outline of the building on two sides. The prints then were arranged as in the diagram below with the outlined edges overlapping the straight edges. The margins of the completed pattern then were trimmed so that the buildings would be vertical. Starting from the top, the prints were assembled like shingles on a roof. The top row was pasted up first, the next row was overlapped, and so on.

composed with prints half of which were printed from the back of the negative.

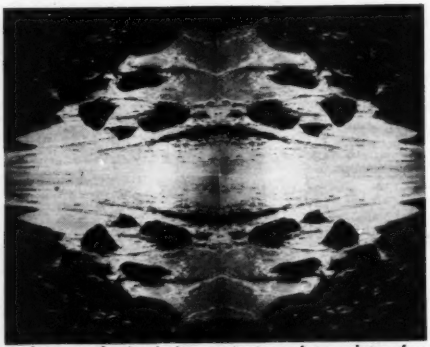


Before making up the prints, sketch the final layout in pencil as a guide for the pasteup. Determine the size of the individual prints desired and the size of the final photo pattern.

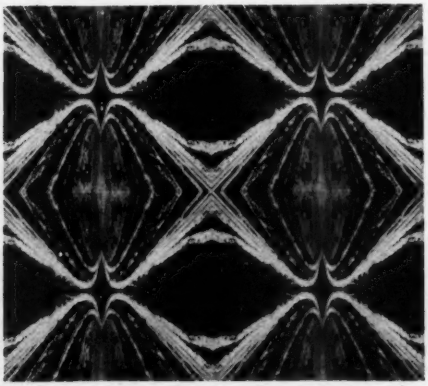
If the individual prints are 3 x 4 inches, the final photo pattern may be about 12 x 16. The size, however, will be determined by the nature of the composition and the presentation to be made of the photo pattern. Prints should be made on single weight paper.



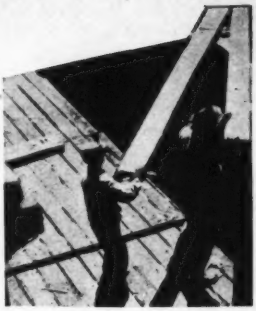
● To make this pattern it was necessary to make 24 prints matched for density and cropped exactly alike. The top edge was cut at an angle as shown in the enlarged section to the right. Like the photo-pattern on the previous page, the success of this pattern depends on skillful overlapping. The top row was pasted first, then the second row, overlapping the bottom of the first row.



● A very simple design made from four prints of a beach snapshot. Two of the prints were printed with the negative reversed. It is a good idea to start your photo-pattern work with a simple subject like this one. Requiring no overlapping, it is easily pasted together.



● Not the pelt of a rare wild animal, but a photo-pattern made from 16 prints of a New Jersey highway.

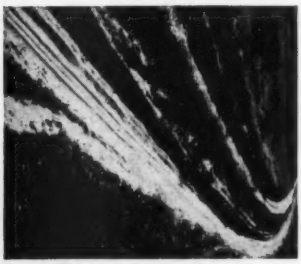


The prints may be arranged on a piece of heavy card-board slightly larger than the finished photo pattern. Mount with rubber cement, beginning in the center of the cardboard and working toward the outer edges.

When prints overlap, the pasting is started along the top of the pattern in the manner of a roof being shingled. One row is pasted down before the next row, with the overlapping edges, is started. Only one parting bit of advice is necessary:

Be sure to time exposure and development so that all of the prints for a photo pattern are of exactly equal density. Enlarger lens should be stopped down so that exposure time is 10 seconds or more to facilitate exact timing. Keep developer at constant temperature.

An example of one of those ordinary-looking photos which furnish good pattern material is seen below. The snapshot of the road was trimmed to give a diagonal composition, as shown below, and 16 prints were made, 8 of which were printed in reverse. To see how it was made visualize the segment shown here laid on the pattern so it will fit into the upper left hand corner of the photo pattern.



"COLD LIGHT" *For Your Enlarger*

For all enlargers, whether handling 35 mm. negatives or 8 x 10 inches, the most desirable light source is a "Neon tube" installation. Gives perfectly cool, and uniform illumination of such brilliance that a 5-second exposure is adequate for many enlargements.

By R. D. V. JOHNSON

THE illuminating system of most enlargers leaves much to be desired. Installation of a "Neon" tube of the type used for electric signs, can readily be accomplished in any enlarger, and will result in the following advantages:

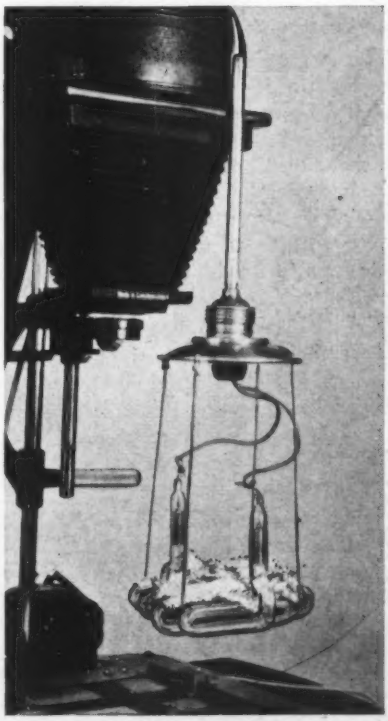
1. Cool operation. The "Neon" tube can burn steadily for hours without appreciable heat. No danger of buckling negatives from excessive heat. Dark rooms kept cool during warm weather.

2. Consistent operation. Flood lamps vary so greatly that standardized routine is impossible. Ordinary incandescent lamps also vary. A "neon" tube yields constant color and volume of light output.

3. Tone quality. The intense light of an incandescent lamp frequently "burns out" delicate tone gradations especially with miniature negatives. "Neon" light preserves tone quality.

4. Focusing ease. A "Neon" tube gives a bright image that is readily focused and composed on the easel. This process may be prolonged without danger to the negative and without necessity of "cooling down" every few minutes if it is desired to carefully compose an image on the easel.

5. Economy. Consuming as much current as a 40-watt lamp, a "Neon" tube can furnish enlarger illumination equal to that of a 500 to 1,000 watt lamp. Printing



● The gas tube is suspended on strings in the lamphouse. The above installation is a 5-foot, 10 mm. tube, grid-shaped, filled with inert gas to give a blue, blue-white or white light. It is suspended 3 inches above the upper enlarger condenser face. The tube operates on a 2500 volt, 30 milliampere transformer. The size of tube should be made to suit your enlarger. The above enlarger handles negatives up to 9 x 12 cm. and smaller enlargers will require smaller tubes. Crumpled tinfoil, placed on the grid, acts as a reflector.

paper is sensitive only to light rays in the upper part of the spectrum which is made up of blue light. Incandescent lamps furnish a great deal of red light that is wasted in printing. The Neon tube for an enlarger should be filled with proper gases to yield a blue or white light for maximum efficiency.

The life of a tube is several thousand hours so it will last as long as a good many incandescent bulbs.

6. Speed. Because of its high actinic value, relatively short exposures can be made.

Anyone can make his own installation or have it done at a total cost of about $10. It is necessary only to have a "Neon" tube of proper size and gas content made by a sign manufacturer.

The expression "Neon" tube is used here because it is the most familiar one. Actually, however, there is no neon gas in the tube used for enlarger illumination. To get the desired color some of the other inert gases in the neon family are made use of. The "Neon sign" man who makes a "Neon" tube to fit your enlarger will know how to furnish the desired color—blue, blue-white or white.

The diameter and length of the tube will be limited by the size of the lamp house. In the installation illustrated, the tube is 5 feet long, and 10mm. in diameter. It may be a round or rectangular "pancake" coil, but the staggered grid form is preferred when possible.

The Neon tube may be suspended inside the lamp house from the usual socket bracket, but this bracket serves only as a mechanical support and not as the source of electrical connection. The writer has made use of a large number of tubes using different colors, different shapes of grid, different tube lengths, and mechanical adaptations. At the present time, an installation is in use which has been giving thoroughly satisfactory results. This is the installation illustrated. It will be seen that it is not in any respect elaborate, but an installation quite within the ability of any experimental amateur to duplicate without having to have recourse to outside help.

The tube is suspended inside the lamp house by means of ordinary cotton cords which are tied to the socket of the original installation. If the bulb support is equipped with a reflector, a small hole may be punched in the edge of the reflector and the cord inserted.

The tinfoil shown in the illustration on the back of the tube is merely sheet tinfoil crumpled up on the back of the tube and held in place with celluloid tape. This tinfoil gives a reflecting surface and, because of its irregular surface, it tends to diffuse and spread the light uniformly.

Anyone can install his own "cold light" unit, but if desired, the local tinsmith can be called in. Or the Neon sign manufacturer may be willing, not only to make the tube, but also to install it in the enlarger. In addition to the tube, a transformer is required.

A "Neon" tube will not operate directly from the house mains. A transformer is required to step up the voltage. The cost should not exceed $5 to $7. The fact that the tube is not to burn continuously, hour after hour, will allow use of a small trans-transformer.

The transformer used on the writer's installation measures 2¾ x 3¾ x 5" and weighs approximately 4½ pounds. This is small enough and light enough to be mounted on top of the lamp house of the usual 9 x 12 enlarger without, in most cases, adding anything to the counter balance weight. In the illustration, the transformer can be seen mounted on the baseboard next to the upright.

The primary side of the transformer is plugged in to the usual house mains (providing it is A. C.) through the "On/Off switch". Then the two wires from the other side of the transformer (the secondary) are connected to the neon tube through the top of the lamp house.

Ordinary lamp cord may be used for the primary wiring but for the secondary side, because of the high voltage, wire that has heavy insulation is required. "High ten-

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CAVERNS AND CAMERAS

● Gypsum Flowers in Mammoth Cave National Park, Ky. Sometimes gypsum covers the walls of the dry parts of caves in a solid sheet — often blossoming forth in "flowers" such as these. Exposure 2 seconds at f4.5 by light of pocket searchlight.

There was a time when photographers could say, "Impossible as a cave," but nowadays underground caverns mean only new and fascinating picture possibilities.

By GEORGE F. JACKSON
Illustrated by the Author

FROM time immemorial the natural underworld has beckoned yet repelled man. The urge to see what is over the horizon, around the next bend, or within the mountain, has ever lured the adventurous. And coupled with man's intense desire to find, or to see the unknown, is the urge to bring back pictorial records in support of one's fantastic and hardly believable stories.

In this day and age it would seem that visiting unexplored, or partly known regions with a view to photographing them, would entail an enormous expenditure of both time and money. But, "believe it or not," this is far from true. For, in the various caves of the world — of which the United States has the very best — the photographer, whether amateur or professional, may find countless unusual, mysterious, or beautiful camera shots. Along with this interesting, and sometimes highly problematical work, one may also satisfy the urge to explore that lurks in the breast of most of us.

Cave photography is not as easy as would at first seem, yet excellent pictures may be taken underground with the simplest, cheapest photographic equipment. Several pictures made by the writer

This is not true. Caves may be found wherever there is a thick bed of limestone underfoot, and are formed by the erosive action of running water. In other words, caves might be called underground river beds, the size of the excavation depending chiefly on the time elapsed since the water started its erosive and chemical work.

The best known cave in this country prob-

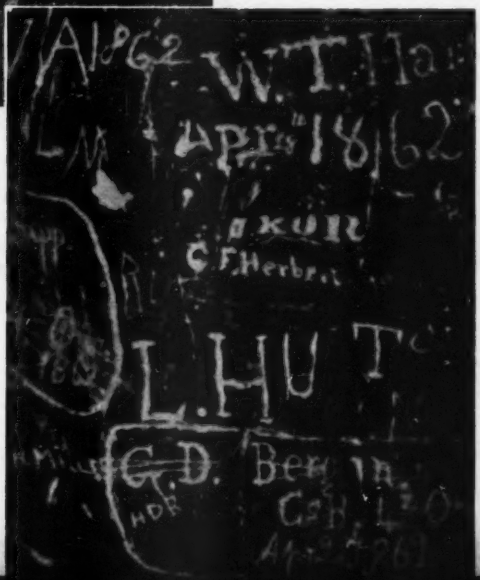
- **An open flash photo (left) showing the stalagmites (floor formations) and stalactites (ceiling formations). The icicle-like growths are formed by the percolation of calcium carbonate.**

- **"Registry Column" in the caverns of Melrose, on Highway U. S. 11, six miles north of Harrisonburg, Va., a huge formation deep underground, on which can be distinctly seen a few of the hundreds of both Union and Confederate soldiers' names carved by troops of opposing armies in these caverns during the war between the States. Lowell Thomas broadcast these caves as: "A Civil War Memorial Underground" and "The only war memorial in the world carved by the soldiers themselves."**

with a box camera, as an experiment, have made successful magazine illustrations. While it is not suggested that this type of camera be used in such work, the above is an example of what may be done.

Before going into the details of actual cave photography, a few words about caves in general may not be amiss.

It is commonly, but erroneously, believed that caves are formed by volcanoes, earthquakes, or the like.



● As glamorous as a movie set is the "Queens Palace" Marengo Cave, Marengo, Ind. Exposure 20 minutes at f22 with illumination from various sources. Typical cavern photography technique involves setting camera on a tripod and then walking through the semidarkness setting off flash bulbs or smokeless flash powder where the photographer thinks they will do the most good—truly drawing with light.

ably is Mammoth Cave, Kentucky, now part of Mammoth Cave National Park. In this section, around the headwaters of Green River, are more underground passages than in any similar section in

(*Page* 84, *please*)

WHY FILTERS?

"DON'T use a filter," is the modern advice, "unless you know WHY you're using it."

By HERBERT C. McKAY, F. R. P. S.

A FILTER is only a piece of colored glass or gelatin and not an amulet or rabbit's foot to be hung on a camera for magically marvelous results.

To learn *what* filters to use and *how* to use them, let's shoot one subject, like the girl shown on these pages, with several commonly-used filters and see what results are obtainable.

We look at our subject and see a green park bench, a girl's face, red lips, colored dress, green foliage, blue sky, and the haze of distant objects. These things, because of their color, vary in brightness. The girl's lips appear bright, so does the sky. The foliage is darker.

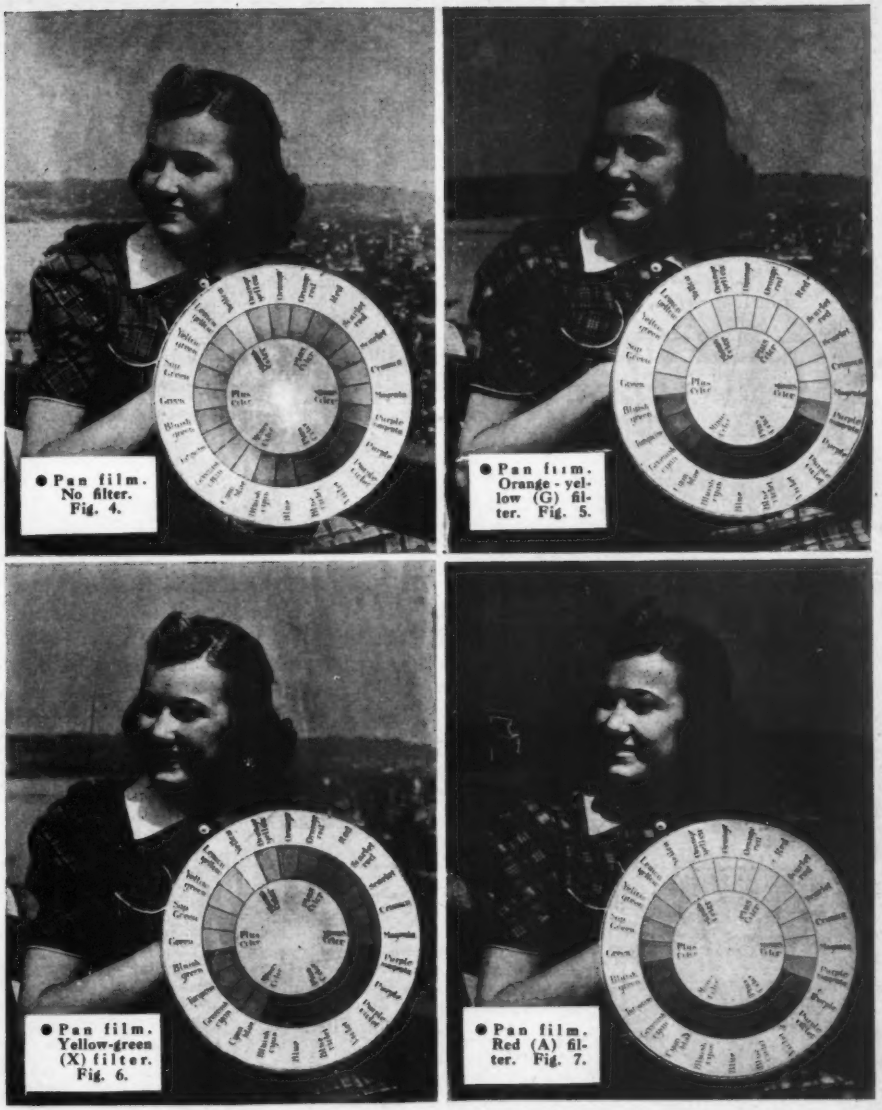
We aim a camera, snap the shutter, and let a piece of film glimpse the scene. This film is going to reproduce the scene in black and white.

The relative brightness of the objects

● Ortho film. No filter. Fig. 1.

● Ortho film. light yellow (K1) filter. Fig. 2.

● Pan film. medium yellow (K2) filter. Fig. 3.



● Use of a filter provides better contrast, less detail in a picture. Note especially the differences in rendering of the blue sky, red lips, green foliage and distant objects. Compare the above colors in each of the circled color charts.

to each other will depend on the type of film used. This is because films vary in their sensitivity to various colors. The chief classification of films is in two groups. (1) orthochromatic film, (2) panchromatic film.

Orthochromatic films are distinguished by their high sensitivity to blue and violet. These colors are very bright to "ortho" film and therefore are rendered in a print as very light tone. Ortho is relatively insensitive to red and reproduces it as black.

Panchromatic films are sensitive to all visual colors and furnish a color render-

Brand Name	Med. Yellow	Yellow-green Light	Yellow-green Dark	Light Red
Agfa	2	.....		48
Eastman	K2	X1	X2	A
Leica	Yellow II	Panchromatic		I. R. light
Lifa	Yellow 2	Green		Red
Mico	Med. yellow	Med. green		Red
Omag	A-2	G1	G2	R2
Optichrome	Yellow 2	Green 1		Lt. red
Orthoplan	Med. yellow	Med. green		Lt. red
Rolleiflex	Med. yellow	Green		Lt. red
Schott	GG6	VG4	VG5	RG2
Zeiss	Med. yellow	Yellow-green		Lt. red

● **The table above lists filters under three groups with the manufacturer's designation for each. The filters in each group are not identical, but are similar enough for all practical purposes. Thus, when a medium yellow filter is desired, for example, an Agfa 2, an Eastman K2, or any of the other filters in the column may be used.**
The Agfa and Eastman (W & W) filters are made of sheet gelatin cemented between plain glass binding covers. The other filters are of solid, colored glass.

ing closer to that of the eye. Blue is *less* bright to pan film than to ortho. Red is *more* bright to pan film than to ortho. This is the broad general distinction between ortho and pan films.

We will photograph our scene with each of these films and see what happens. In order to name the colors and provide a more accurate guide, a color chart is pasted in the foreground.

Fig. 1 was taken with any ortho film (such as Verichrome, Plenachrome or other "chrome" trade names). Note that the girl's lips are dark; compare with the wedge marked "red" on the chart. The sky is light; compare with the wedge marked "blue" on the chart.

Fig. 4. was taken with pan film (any film with the word pan or panchromatic as part of its name, such as S. S. Pan, etc.) The lips are lighter than in Fig. 1, the sky is darker and less "bald" looking. There is less haze and an improved rendering of distant objects.

Now let's try a few commonly used filters and see how the tones of the various colors may be corrected, upset or otherwise affected.

Film	Normal Correction		Special
	Daylight	Mazda Light	
Orthochromatic film is blind to red.	Medium yellow filter darkens blue and makes yellow and green colors brighter.	No filter. The lack of blue in this light makes it equivalent to daylight with a yellow filter.	Dark yellow filter brightens green considerably. Makes blue sky dark and aids in cutting haze in distant landscapes.
Ordinary panchromatic film reacts to all colors; green least of all.	Medium yellow acts as with ortho; light yellow green even better.	Same as ortho.	Orange filter gives good haze cutting for distance.
Super panchromatic is extremely sensitive to red.	"X" type of yellow green filter acts as yellow with ortho and cuts down excessive red making it darker.	"X" type of filter cuts down the red, making it darker. Red is too light with no filter.	Red filter makes blue sky almost black and darkens gray sky. Red filter gives strong haze cutting action.

● **All films have a definite color reaction, none of them corresponding exactly to visual values. To obtain values in black and white which correspond to the visual brightness of the colors, it is necessary to use the "normal correction" filter. For special effects it is desirable to use other filters. This table gives the normal correction and some of the more common over-correction filters, as well as basic characteristics of the films.**

In each case we can study what happens to each color. Consider the red, for example, and compare the tone of the girl's lips in each of the photographs. Select the "red" wedge in the color chart and compare with the corresponding color wedge in each of the other charts. Note, for example, how dark the red wedge is in the chart of Fig. 1 and how light in Fig. 7.

Then consider green and blue each in the same way. Compare the rendering of the foliage and the sky, and check with the green and blue color wedges.

Now let us sort of review the entire subject by answering questions:

What is a filter? A piece of flat glass or gelatin to be placed over the camera lens. It may be colored glass or gelatin between glass. The solid glass type is best.

What is the photographic effect of a filter? It "strains out" or absorbs certain colors so that the completed photograph will show colors as tones of gray in the desired degree of brightness.

What filters are advisable for the beginner? A medium or dark yellow for orthochromatic films; yellow-green "X1" and "X2" for use with panchromatic film by daylight and artificial light respectively.

What filter should be used? Ordinarily orthochromatic filters take yellow filters while panchromatic films use the "X" type which is a yellow-green filter.

What filters are used with photoflood light? Orthochromatic films need no filter. The panchromatic films need the dark (X2) yellow-green filter to eliminate some of the red.

Why are other filters used? Filters cause objects of their own color to photograph lighter than they would without the filter. Conversely, opposite colors are caused to photograph dark. Thus the red filter causes the sky to photograph very dark if it is a true blue sky. Gray skies photograph light even with red filter. Red buildings or costumes photograph as al-

(*Page* 81, *please*)

● **Filters are used primarily to change the contrast in the subject so that the various tones of gray correspond to the contrast effect of the colors as seen by the eye. In some cases certain colors are to be lightened; in some certain colors are to be darkened. This table suggests filters which will give the desired results.**

Subject	Panchromatic Film		Orthochromatic Film	
	Daylight	Mazda Light	Daylight	Mazda Light
	Filters to use			
Blue sky	"X" type		Med. yellow	
Gray sky	Orange-red		Dark yellow Orange yellow	
Stormy sky	"X" type		Med. yellow	
Green foliage	"X" type or Blue-green	Dark "X"	Med. yellow	None
Autumn foliage	Orange-yellow	None	Dark yellow	Med. yellow
Beach	"X" type or Red for contrast		Dark yellow	
Blue flowers	"X" type	Dark "X"	Med. yellow	Light yellow
Yellow flowers	Dark yellow	Med. yellow	Med. yellow	Light yellow
Red flowers	Orange. Orange-red	None or Light yellow	Dark yellow	None
Water	Blue-green or Polarizer		Light green or Polarizer	
Portrait	"X" type	Dark "X"	Med. yellow	None
Black sky	Dark red		Orange-yellow (G)	
Haze cutting	Dark red		Orange-yellow (G)	
Red or yellow fruit on trees	Red or orange		Orange-yellow	

HOW *to use* *Flash!*

In handy question and answer form, here is up-to-date data to solve your problems in the use of flash bulbs and synchronizers.

By RUS ARNOLD

● A statue photographed by ordinary sunlight (below) and the same subject (right) by flash lighting. For brilliant "snappy" negatives, press photographers use flash bulbs whenever possible and even in daylight.

THE secret of making a synchronizer is to delay the shutter sufficiently so that it is open while the flash is at its peak. Anybody can make a good synchronizer to work at slow speeds. There were instructions for such a gadget in the April issue of MINICAM. If you want higher speeds you must leave the job of making your synchronizer to an expert equipped with electrical testing devices.

The need for these devices requires a little explanation. A Compur shutter (assuming good condition) is wide open 1/1000th part of a second after the release is pressed. It remains open for the duration of the exposure for which it is set, after which it takes 1/1000th second

to close. The flashbulb, an electrical device set off by an electric current spark, takes longer. The exact amount of "lag" (the time between the beginning of the electrical impulse and the peak of the flash) depends on the particular make and size, and also varies slightly within the same size. With any bulb, if you start off both bulb and shutter at the same instant, with the shutter at 1/200, the shutter will be closed before the bulb has really started to flash. You get either no exposure at all, or underexposure. Your problem is to speed up the bulb (which you cannot do) or delay the shutter until the proper instant. This is what a synchronizer does. The manufacturers have lessened the problem, recently, by standardizing bulbs so that all (except the No. 10 and No. 75) have approximately the same lag, and can therefore be synchronized with the same amount of shutter-delay.

* * *

• Is Synchronized Flash Just an Easier Way to Take the Same Pictures? Or Can It Be Used to Make Unusual Pictures?

There are many shots that cannot be taken without synchronized flash, and many tricks can be done with it. For instance, there is the synchro-sunlight picture, in which a flash is used to "kick-in" shadow detail in a picture against the sun.

Another trick is the flash montage, by which, using one model and successive exposures on the same negative, you can have that model making faces at himself, taking his own picture, or even kicking himself. Such montages should be taken where there is no other illumination and the background is dead black.

An excellent use for the tandem flash is to put light where you would expect light to be: inside a fireplace, a contact printer, or a table-lamp. You can vary such shots by using different size bulbs in the extension and at the camera, or by having no bulb at all on the camera. Such pictures can be very dramatic, yet have good shadow detail. At the recent Photographic Exposition in New York I had to photograph Miss Candid Camera taking a synchroflash picture of a crowd of minibugs. Normally such a shot would be flat, despite Miss C.C.'s lovely face and bathing suit. I connected the battery case on her camera to my synchronizer using a tandem extension. When I shot the picture (1/200th at about *f*12.5, at 10 feet) her flashbulb and mine both synchronized. The picture shows a flash from her camera illuminating the crowd in front of her!

* * *

• What Film Shall I Use? Fast or Slow? Ortho or Pan?

Most lensmen have switched to the fastest pans for synchroflash work. Many are using only the new ultra-super-extra-hyper-fast films. There are two basic errors here.

First, you do not always need fast film with flashbulbs, any more than you need fast lenses. Since slow film will usually give you finer grain than fast film under similar circumstances, you would do better using the slow film and increasing lens opening.

Second, ortho film is as fast as pan, to flashlight, as films may be judged for speedgun exposure by their DAYLIGHT rating, rather than their incandescent rating. Thus, Agfa Super Plenachrome and Superpan (both rated Weston 24 in daylight) can be given the same flash exposure.

When to use which? Use the same rules that apply in other pictures. For clearer skin tones, to avoid retouching, use pan. For blue-eyed babies, use ortho. Where color rendering is important, use pan. For groups, with large areas of dark clothing, you will find ortho gives better separation in the dark tones. For machinery, try ortho. And so on. Keep both pan and ortho on hand, plus a roll or two of the very high-speed (Ultra Speed, X L, or similar) pans for emergency use in very dark places, at night outdoors, or in large halls.

* * *

(Focal plane or Compur shutter? What bulb to) use? What exposure? Developer? What is the most efficient shutter speed? How to avoid flat lighting? How to take color pictures?—these are among the questions which will be answered here next month. If you have any problems, address them to the "Flash" Question Editor.)

LET'S MAKE PICTURES

An interview with J. Ghislain Lootens

By STANLEY RAYFIELD

"Don't worry about technique," says this teacher of photographic techniques. "In the beginning, camera coordination is what counts."

● J. GHISLAIN LOOTENS, F. R. P. S.

"YOU don't have to know anything about photography to take good pictures. All you need is a camera and a pair of eyes."

Sounds simple, doesn't it? J. Ghislain Lootens ought to know because he has been practicing and teaching this advice for years. Into his busy life he crowds professional assignments and still finds time to wander into the countryside in search of beautiful pictorial studies that will be seen in American and international salons.

"How can the average guy take good pictures?" everyone asks him. And Lootens has the answer. You might call it the "Lootens formula" for picture-taking success. Before going into it, however, we should have an understanding of the man.

His introduction to serious photography was not a mechanical experience but a visual one. Like most of us, he says, he once was "camera-blind." Then suddenly he began seeing from the camera point of view. Commonplace things became interesting and significant.

It happened nearly a score of years ago. Lootens was on a walking tour with a friend who soon was sitting in a ditch photographing a flower. "I thought he was just plain crazy," Looten's said. "Here was a fellow all twisted up in the mud pointing his lens at something I would not have looked at under even the best circumstances. But that lowly flower must have awakened something in me, for pretty soon my box camera abandoned Aunt Tillie standing in the blinding sun against a wire fence with a telegraph pole growing out of her head — and sought new subjects." Lootens got himself a new camera, too.

People and things which appeared "ordinary" to the ordinary eye, suddenly became important and beautiful from the camera viewpoint. He began seeing thousands of details previously overlooked. He noticed the arrangement of objects and lines, differences in tones, and the effects of lighting — it was like a deep religious experience — he was becoming a photographer.

Lootens today does more lecturing and picture taking than any other young photographer, but still feels the perfect print has yet to be made. He likes to criticize his own prints although they are salon pictures of acknowledged merit.

What a Future, for example, would be better if the window cleaner had been better placed and if he had been busily at work instead of looking down at the photographer.

WHAT A FUTURE

● Not a "nutty modernist," Lootens nevertheless can take "modern" pictures. Although not a purist, he can spend hours working with one negative.

LAUGHING EYES

● **Although called a "master of portraiture," Lootens does not like to be typed. His formula — use ortho film; employ your family as models; don't *talk* pictures, *take* pictures. He believes rules are made to be broken. For example, he preaches use of a single light in portraiture, but was content to employ two lights to make the above print.**

operating at too slow a shutter speed. Even with a large camera, it is a good idea to shoot at 1/50th second or faster.

Expression is a real candid shot stolen from underneath the outstretched arm of a person in front. The entire negative shows a large group of people. The portion used to make this picture is smaller than a 35 mm. frame. The camera was an Ideal-B (9x12 cm.) which shows that any camera may be made to do candid work in a pinch. You don't need a special high-powered apparatus for stealing pictures. Incidentally, Lootens believes that the best candid shots are posed. But you must trip your shutter before the subject "freezes" and spontaneity it lost.

Of course, you cannot say much about the composition of a real candid shot — it depends almost entirely on human appeal for its success — but *Expression* might be improved, says Lootens, by moving the woman's head more to the right of the pic-

The title illustrates that a good title can add something to a print by stirring the imagination. The obvious humor suggested itself in a flash, and Lootens composed and snapped the picture with a Contax, *f*6.3 at 1/125th second.

He never shoots at less than 1/100 of a second with a miniature camera if he can help it. He rarely takes pictures at less than 1/50 sec. with a hand-held miniature. It is important to eliminate hand wobble; any speed slower than 1/50 sec. will probably show the defect. Many a fine picture has been ruined because of slight camera movement when

HERE'S WHAT MAKES A GOOD PRINT

1. **Subject matter—skillfully and imaginatively treated.**
2. **Print quality—detail in highlights and shadows.**
3. **Composition—arrangement of picture elements in a pleasing manner.**

And just so you will know them, here are the characteristics of a bad picture:

1. **Uninteresting subject matter, trite or lacking human appeal.**
2. **Poor print quality caused by incorrect exposure or development, wrong choice of paper, improper balancing of tones, or poor dodging.**
3. **Composition that lacks simplicity, unity, or balance.**

ture, thus separating it from that of the boy. The pattern is triangular, and a better position of the woman's head would have carried out this composition perfectly. The spotty background is disturbing, being thrown too far out of focus. But when shooting on the wing, speed is essential and we have to take what we can get.

There is a story in the expressions of the people in this shot. What are they looking at? Why do they look scared and frightened? Why is the little boy on the left clutching up his arm that way? Has somebody just been killed? No, they are merely watching a man oiling a miniature locomotive at a summer resort!

Lootens has given many courses and lectures on portraiture and says it is easy to make a good portrait.

"Use only one light. It's a pet idea of mine." That's the first thing. With one light you cannot go wrong as far as modelling is concerned. Most amateurs play around with several lights, and how they distort the skull structure — the jaw becomes mis-shapen or cheek bone emphasis falls in the wrong place.

Watch the shadow under the nose to see if your one light is placed correctly. The best position usually is 45 degree lighting with the shadow falling midway between nose and the upper lip. Keep the light to one side and move it until the best modelling of the features is obtained.

Camera angle is most important. The normal position is to have the lens just below the tip of the nose. But for a face with, say, a prominent jaw and small nose, raise to eye level. This will make the jaw smaller and the nose larger. Conversely, for a subject with a weak chin and prominent nose, drop the camera below chin level to build up the weak part of the face, and at the same time minimize the nose. Never take a portrait nearer than eight feet. Closer than that gives violent perspective. Use orthochromatic film for portraits; it does not wash out the lips and presents facial modelling better than pan film.

EXPRESSION

● **A candid shot made under the arm of a spectator with an Ideal-B and 3¼ x 4¼ film to show it could be done with a large camera. Paradoxically, Lootens says the best "candid" shots are planned and posed. What are the subjects watching?**

Lootens never uses professional models in his classes. Students make portraits of each other. Your own friends and family make the most interesting models, he says, and you will learn much more about the problems of portraiture in working with average faces. A beautiful professional model in a class "kids" you along by posing perfectly, and with the proper make-up. You go home and think you are a swell portrait photographer until you try photographing the wife. Then you find out!

It seems a long road from a box camera to a leading position in photographic

circles, but Lootens did it in short order. As a pictorialist he is internationally known. I think if you ask him to sum up the secret of his success he will say: "It's very simple. Just go out and take pictures, and keep on taking pictures. See pictures everywhere, in everything. When you have a highly trained camera eye, then catch up on your technique every now and then. But above all, keep on taking and making pictures. Less theory and much more field work, and we shall have armies of fine photographers."

Good judgment is of the first importance, but you cannot acquire this unless you are taking pictures all the time. You must train your photographic eye. Acquire a critical, comparative sense between your pictures and other peoples.

The average amateur and professional has about 85% more theoretical knowledge than practical work. So spend more time taking rather than talking.

Don't worry about technique to begin with. Learn first, to get something interesting on that negative. Then check back periodically on your technical knowledge and take another look at old negatives. At present I am exhibiting two prints worked up from negatives I shot fifteen years ago when I hardly knew a lens from a focal plane.

Most young photographers think they ought to be experts in chemistry and optics so they wander off into side roads. They may know a lot about photography, but they never make a good picture, and, after all, people are more interested in pictures than theories.

Only picture-taking practice can teach the amateur to handle subject matter properly. A technically fine print may be uninteresting because the subject matter falls down, but a fuzzy looking print may be arresting if it tells a powerful story. Continual picture taking makes for coordination between you and your camera. You soon streamline all the mechanical operations of focusing, exposure, and so forth. You work smoothly, cleanly, efficiently, and, what's most important, you get that picture.

As a successful photographer, Lootens is, of course, an expert on dark room technique. A good print, he says, is a combination of subject matter and technical quality. Of course, a good print has something we call "print quality." That is, it has the right degree of contrast between the highlights and the shadows. But more than that, it has contrast *within* the highlights and *within* the shadows. That is most important. In a sky, for instance, you must get fine modelling *within* the clouds. When, in addition, all the elements in the subject matter hang together you have a fine picture.

In pictorial photography, don't try to cover too great a range of tone. In other words, avoid too full-scale prints. Keep tones in close relation in the same key, whether it is high, low, or middle. A print is easier to look at and more forceful if it is held within a narrow tone range.

Another thing — don't specialize or type yourself — at least not right away. Study all the different schools but don't copy any of them. Learn all you can from each one, and eventually, if you have imagination and originality, you will acquire a style which will suit your requirements and express your own individuality.

No one can type J. Ghislain Lootens. He worked for a while as a professional portraitist, but he certainly isn't one now. He can take pictures like "What a Future!" but he will not let himself become a "nutty modernist" as he describes the camera fiend who lays on the floor or dangles from the chandelier. He will do it, too, if necessary, but he is also capable of spending hours patiently working over a paper negative. "I am more interested in producing beautiful pictures," he says, "than in seeking out the striking stuff. The former will last for ever, the latter only for the passing moment."

HOT WEATHER HINTS

Tropical temperatures hold no terrors when film is properly cared for not only during development, but also before and after exposure.

By Harris West

HOT weather brings two chief problems (1) caring for film (2) developing film.

Caring for film in hot weather involves two problems: (1) temperature, (2) humidity. Film, either exposed or unexposed, is adversely affected by each of these two factors. The temperature cannot always be controlled but humidity can be controlled by storing the film in a moisture proof container. When moisture is not present, film can undergo relatively high temperatures without any detoriation whatsoever. Whether you are taking a trip around the world or making a week end journey to the sea shore—or wherever the air is fairly humid—arrange for a moisture proof container to carry your film.

The simplest hygroscopic (moisture absorbing) agent is dry newspaper. Dry a quantity of newspaper over a flame until it becomes crisp. Cool the paper by waving in the air and then wrap around the original film containers. It is not necessary to remove the films' original wrappings assuming that up to this stage the film has been stored in a dry atmosphere.

Blotting paper, dried as above, also may be used.

Perhaps the most efficient and economical hygroscopic substance is calcium chloride. Cut up some blotting paper in convenient pieces about 3x4 inches or whichever size is most convenient for your packing box. Drop these blotters into a solution of calcium chloride—a few ounces of this chemical can be obtained at your drug store—and boil slowly until all the water is gone. Dry the blotters in an oven, cool, and place in the box with the film. After a few days in an air tight box with film that has become moisture laden, the blotters will become damp. Dry the blotters and they can be used over and over. Asbestos paper also can be used. In addition, there are patented hygroscopic agents on the market which can be used.

Equipped with a convenient cardboard or metal moisture-proof box, for exposed and unexposed film, the traveller can safely carry film for a long period of time or until conditions are suitable for developing.

If it is necessary to develop film in hot weather, the solutions can be cooled by one of several methods.

The usual cooling device of ice cubes in a water "jacket," which may be a large water-filled tray, with the smaller processing trays or the film tank resting in the larger, is probably still the best for the average worker. Another cooling method is to allow cold water to run through a rubber tube, with the mouth of the tube next to one of the outside walls of the tray. Paper, unlike film, may be developed at relatively high temperatures.

Do not put ice into a solution as this causes dilution. Ice cubes can be put into toy balloons and the latter, filled with water, can be frozen in a refrigerator. Each frozen balloon becomes a cooling unit.

In the tropics, water commonly is cooled by hanging in the shade in a porous bag. Evaporation from the surface of the bag lowers the temperature.

Miniature film cannot satisfactorily be developed at temperatures higher than 70 degrees F. Film about 2¼x2¼ or film that will not be enlarged to a great degree or film in which there is no fear of excessive grain may be developed at higher temperatures. Developing formula Agfa 64 can be used at temperatures from 65° to 80° F.

AGFA 64

Water	24
Metol (or Elon)	36 grains
Sulphite	¾ oz., 40 grains
Hydroquinone	95 grains
Carbonate	½ oz., 15 grains
Potassium Bromide	15 grains
Water to make	32 oz.

Not a Fine Grain Developer

Develop 3 to 4 minutes at 65° F. or 2 to 3 minutes at 80° F.

A NON-BLISTERING formula well suited for hot weather developing is the Eastman Kodak developer DK 15. It will develop film at temperatures up to 90°. It is not a fine grain developer.

A patented developer scheduled to appear on the market about August 1 is Harvey's Panthermic 777. This developer is especially designed for operation at relatively high temperatures. It probably should be the most desirable developer for use at high temperatures when fine grain results are demanded.

When developing at 75° or higher, a hardening short stop always should be used. Formalin used to be the favorite for use for this purpose by tropical explorers and hardeners

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KEEP IT SIMPLE

Beginners in composition will do well to follow this formula which is well-appreciated by every accomplished picture-maker.

By GALWAY MAYO
Illustrated by the Author

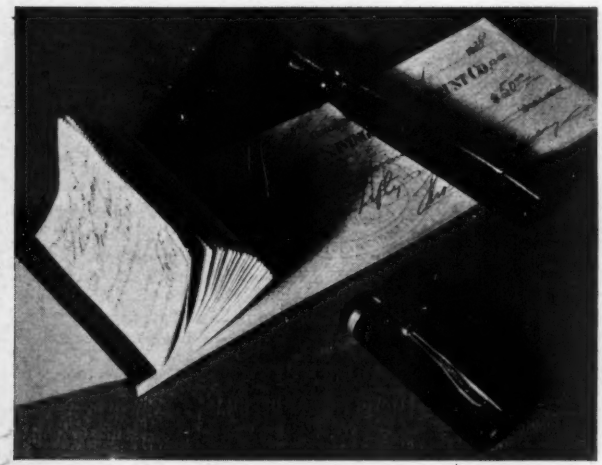
A GOOD photograph is determined as much by what is left out as by what is put in. Simplicity is poetry—and good photography. A poet does not write a whole book to describe an emotion, but reduces it to its essence, and a few phrases can recreate a lifetime's experience.

To get the feel of simplicity, start with a small group of objects and see how interesting you can make them. Take, for example, a check book and a fountain pen. The check book can be opened, closed, arranged in various positions. The fountain pen separates into two sections—the barrel and the cap, and these also can be arranged in a number of positions. With only two objects, you have no lack of flexibility.

Looking at them casually, one might be inclined to ask—who should anyone bother to photograph a fountain pen and a check book when there are so many interesting things to be shot—fire engines and beautiful girls and houses falling down?

The answer to that is that if you can take a fountain pen and a check book and make them interesting, you will be better able to get more interesting, better

● A readily understandable picture and a pleasant composition attained by an easy direct balance. Two photofloods at four feet, f22 at 1 second.



● This is one-half of the second exposure. Each half of this composition retains a balance of its own.

balanced shots of subjects that have, in themselves, greater natural interest. A tough problem like a checkbook and fountain pen develops ingenuity and photographic technique. And these things stand you in good stead no matter what kind of shot you are taking.

Of course, in taking photographs of these two objects, we take it for granted that you can control light conditions. If you couldn't, the chances are that neither you nor anyone else could make so prosaic a pair of objects interesting.

Let's look at our first photograph. The checkbook was opened and laid on a canvas background. This canvas background is more important than it might appear at first blush. It has a texture different from either the fountain pen or the checkbook, both of which are smooth. Contrasts in texture add interest.

Then, we place the fountain pen in position. At first glance this might seem as if the barrel and the cap were simply dropped there, a light thrown across them and the subject shot. But that isn't true. Notice that in the checkbook, a series of diagonal lines are repeated. Notice, too, that the position of the barrel and cap of the fountain pen repeat these diagonal lines.

Why? Because repetition of the same form or lines creates a pleasant symetrical quality. However, if the same form is repeated too often without variation, the photo becomes boring and monotonous. Which is easily understandable.

If a musician, let us say, were to take a musical theme and play it over and over again, his listeners would be bored silly. But when he plays the same theme with variations and transitions, he is playing a composition. And his listeners, instead of being bored, are pleased by the varied repetition of a harmony which is familiar to them and which the musician manages to keep new and changing.

By using more than one light, it is possible to create shadows which repeat the forms of the objects with varying intensity. Here it is important to remember that shadows, even though basically related to the objects, can be so distorted that they throw the whole composition out of balance and seem to have no relation to the objects which, in this case, are the core of the photograph.

For the first photograph, we used one photoflood to cast the shadows and a second on the opposite side to lighten

● To express irritation, the composition was deliberately thrown off balance by a blot of ink and by moving the barrel and cap of the fountain pen.

● Winding up on a happy note, the book is closed and a circle created by means of torn bits of paper and paper dolls. The circle gains added interest by being cut into two different angles, the angle of the fountain pen and that of the check book. Notice that the black shadow of the fountain pen balances the weight of the blank check book.

the shadows and to pick out the outlines of the objects and give them substance.

Wouldn't the shadows be darker and sharper if we used only one light? They probably would. As a matter of fact, the whole photograph would be darker and you might not be able to see the fountain pen. It would simply come up as a blob of black.

One other thing before we get on to the next picture. Notice that the whole feeling of the first photograph is pleasant, easy, direct balance along a diagonal line united by mild shadows along a bisecting diagonal line. All in all, a pleasing, readily understandable composition.

In the next photograph, we have a blot on the checkbook. Here we want to get away from the pleasing symetrical balance appearing in the first photo. To express the irritation that people usually feel when they blot something, we deliberately threw the composition off balance. The barrel of the fountain pen does not lie on a parallel with the diagonal line of the checkbook. And the cap gives us a further variance. In this, we have deliberately destroyed any pleasing, restful atmosphere that might be present.

In our third photograph, we decided to wind up the check writing episode on a happy note so we worked for a composition that was circular without being obviously so. If you will notice, you can virtually trace a circle through the center of the torn bits of paper, through the little paper dolls and back again to the beginning of the torn bits of paper. This circle is given added interest by being cut into on two different angles, the angle of the fountain pen and the angle at which the checkbook is placed. Notice, too, that the black shadow of the fountain pen helps to balance the weight of the black checkbook.

In these three shots a little story is told. The compositions are varied and there is a reason for their variance. In the first, we have a neutral, pleasant symmetry. In the second we have a discordan composition which expresses the discordant note which the blot introduces. In the third we deliberately worked for a pleasant compositional unit, best expressed by the circle.

For each of these we used a type of composition that seemed best adapted to the subject. Not one of the three could be called a formal composition because not one has absolute balance.

Turning from the fountain pen and checkbook compositions to the more naturally poetic study of swans, we find a good example of a rhythmic light mass against a dark rhythmic background. Notice how the swans repeat a graceful oval with variations. Then notice that the background of water also contains

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SWANS By LAMAR MUMBAR

● A simple subject, gracefully executed. Great detail is not desired in a composition like the above which depends entirely on the placing of the grey masses on the simple detailless background.

LAW FOR PHOTOGRAPHERS, II

Questions presented and answered by a lawyer as a sequel to the article under this title last month

By Alexander Schamban

Q. May pictures be taken from any place or position that the camera man chooses?

A. Yes, provided the camera man does not trespass on private property. The photographer, like anyone else, must respect property rights. If he goes on private property without the permission of the owner or attendent, he becomes a trespasser.

Q. What about taking pictures from public property, such as highways, sidewalks, public buildings, or parks?

A. Perfectly O. K. Unless some specific law or municipal ordinance forbids the taking of pictures while on public domain, the fan is within his rights. Such type of restriction has been enforced in Navy Yards, U. S. mints, hospitals, museums, etc.

In New York City parks, for example, a permit is required for commercial photography. No charge is made for this permit, which is obtainable from the Department of Parks.

No restrictions are made on amateur photographers in New York City Parks except that the use of tripods is prohibited in zoo areas, at swimming pools and bathing beaches, where the density of crowds would make them objectionable.

Q. Are there any restrictions on the choice of a subject for a picture?

A. Generally speaking, no. The photographer has the right to shoot whatever and whomever he pleases.

Q. What are some of the exceptions to this general rule of freedom of choice of subject?

A. From time to time, Federal authorities have imposed restrictions upon shooting pix of fortifications, naval maneuvers, plane construction progress, etc.

Q. Have civil authorities ever forbidden the taking of pix of certain subjects?

A. Yes. The most frequent illustration occurs where Judges forbid photographing in courtrooms. Photographers who did not pay heed to these restrictions have been found guilty of contempt of court and punished.

Q. Aside from these possible restrictions, must the minicam fan obtain the permission of the subject before taking the photograph?

A. In most cases, no. The subject, notwithstanding how unwilling he or she may be, cannot, legally, restrain the fan from shooting the pic. The "right of privacy," or, as often stated, the "right to be let alone," is not violated or invaded by the mere taking of a picture. The right to show the picture, however, is another matter.

Q. When must the permission of the subject be obtained?

A. Consent of the subject is necessary, for the legal protection of the photographer, when the pic is intended for use in advertising or some publicity program.

Q. How should this permission be obtained?

A. The proper and safe way is to secure the subject's permission in writing. The written consent, should not only permit the taking of the picture, but also approve its subsequent and intended use. You may copy and use the following form:

MODEL RELEASE

In consideration of *John Photographer's* promise to deliver to me, free from cost or charge whatsoever, *three* finished photographs, I grant him permission to take my photograph. I further consent to whatever legal use or purpose to which he may place the finished photographs, granting to him the right to sell or transfer ownership in them to any publication or individual that he may deem proper. I relinquish any right that I may have in the photograph, original or any copy thereof. Signed and witnessed this *10th* day of *June*, 1938.

.....(SEAL)

Witnesses:

.....

.....

Q. Must this written consent or approval be in particular form and "legal" language?

A. No. The subject's consent, generally, should be a release of all rights of the subject in the picture and also permission for the photographer to use it for the designated purpose. The subject should express, in the release or approval, receipt of whatever consideration was given in exchange for the right to take and use the photograph.

Q. Must the photographer share with the subject the financial returns secured from the sale of the photograph?

A. No, unless there is an agreement to the contrary.

Q. If the subject is to share in the re-

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CRITICAL

THE snapshots presented in this department this month reveal certain strong points and weaknesses that are especially pertinent.

The New York skyline will always prove a temptation to the man with a camera. Equally fascinating to the visitor and the native, it is a fertile field for striking pictures. Upon its varied moods, many a salon reputation has been built. After all these years, it would seem impossible to make a picture of New York which would be new or different. But it is still being done.

While "End of Day" shows some attempt at serious pictorialism, it is weak compared to previous studies of the same locality. The Brooklyn Bridge is still the most favorite spot from which to photograph lower Manhattan and here part of the cable supports are called upon to act as a frame for the skyline. A good idea, but not a new one, it would have improved the picture if a greater number of the vertical and horizontal cables had been shown, to create a more interesting design. The main cable stretching across the top of the picture without visible support does not help the composition. We suggest cropping as shown by the white lines. This will make a nicer frame and eliminate the blank sky up above.

If it is desired to keep the building in such a deep tone, it would help the dramatic effect if the sky and water also were printed darker. As it is, this sunset is not a particularly good sample of what can be seen in the lower harbor. Another try on a more favorable day might bring success.

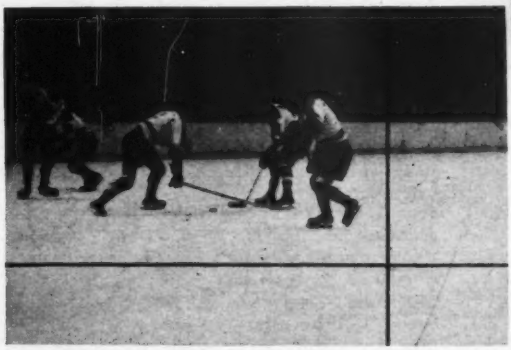
The two light spots in the shadow area of the buildings are caused by pointing the lens directly into the sun. The lens should always be protected by a sunshade of course, but in an extreme case such as this even this helpful accessory will not always solve the trouble.

• END OF DAY — 1/25th at f5.6 — Eastman Super X film. Contax.

TO the average amateur a picture of any object under artificial light presents a technical problem. We further complicate matters when we shoot at a moving object.

Practically any kind of camera or any type of film can be used to take pictures under artificial light, provided the object being photographed does not move during the exposure. All that is required in such a case is a sturdy tripod or other rigid support for the camera. The correct exposure can be determined by an exposure table, meter or by actual tests. Whether the exposure is one second or one hour really does not matter, so long as nothing moves during that time. The photographer is in complete control and can either add more lights or open up the lens diaphgram, or do both, to shorten the length of exposure.

However, to take successful action pictures under artificial light demands the use of a very fast lens and extremely sensitive film. There are times of course, when lighting conditions are so favorable that even a lens with the comparatively slow opening of *f*4.5 will secure fairly good results, but such cases are rare and are limited to slow action. To



• "HOCKEY GAME" — 1/125th at *f*2 — Agfa Supreme film.

tackle all sorts of stage and sport scenes and under variable light conditions, we need a lens which will open up to *f*2.8, while *f*2 is even more desirable, and naturally an *f*1.5 lens tops them all.

After starting with appropriate lens equipment, we should select the most sensitive film available. In this connection, the manufacturers have certainly done a wonderful job. Within the last few months, many films of extremely high sensitivity have appeared, making night pictures possible that were undreamed of a couple of years ago.

The rapid movement of the action determines the setting of the shutter, which in its turn determines the aperture of the lens. This is true of action shots whether indoors or outdoors. As a rule, it is not advisable to use a slower shutter speed than 1/100th of a second, while speeds of 1/250th or 1/500th are preferable, if the lens and film are fast enough to permit this shutter speed.

• "JOHN" — 1/10th at *f*3.5. Zeiss-Ikon Super Ikonta B.

After making our exposures, the problem of development steps in. The chief difficulty in this respect is that the highlights—(the black portions in the negative which later appear white in the print)—become too opaque or dense with ordinary development while the shadows remain transparent in the negative. This invariably results in a very contrasty negative. A safe rule to follow, regardless of the developer used, is to undervelop such negatives; allow from 10 to 30 per cent less than normal development time. The amount of underdevelopment will depend on the original contrast of the scene and the type of film. The harsher the lighting and the contrastier the film, the less time spent in the developer. A panchromatic film will be used not only for its greater speed but also because it is less contrasty than an ortho film.

The illustration here is a good technical example of an indoor shot covering sport action. The strong reflecting surface of the ice was a help in obtaining a well exposed negative of the players themselves. You will note that even the audience in the background—representing the shadow portion—is also visible, which is an indication of the correct choice of film, exposure and development. This is field

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August's PICTORIAL ANALYSIS

The most frequently asked question is "WHY is a certain print good? WHY is another bad?" In reply, this department will each month reproduce a print of acknowledged merit and "take it apart" to criticize the print's shortcomings and analyze the sources of its effectiveness.

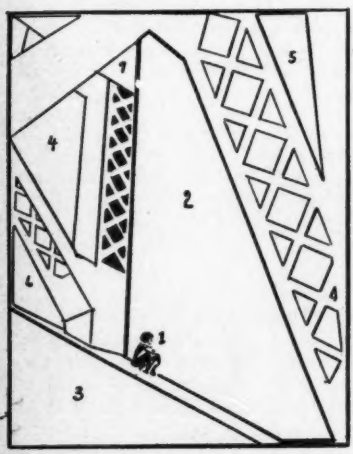
By J. GHISLAIN LOOTENS, F. R. P. S.*

EVERY worthwhile picture leaves a first impression. Our mind immediately types it as belonging to a definite class or portraying a certain mood. When we walk into a salon and view a picture on the wall, we are first aware that it is a romantic landscape, a clever design or, perhaps, a daring pattern. The details of the picture or its story-telling properties may not be appreciated until further close analysis. What our eyes detect immediately is a basic structure.

It is as if we entered a room in which a group of men are placed along the walls for our inspection. A quick glance, from face to face, and our mind types them into distinctive categories or arranges them into broad general groups. Some we would classify as honest, aggressive, alert, domineering, etc. Later on, upon better acquaintance we might have to qualify these generalities as no one person can actually be summed up in just a single word. As in analyzing pictures, it would take a little time to see all the "details" and "variations".

Our first impression when looking at Mr. Muller's photograph is its bold and striking quality. It gives a feeling of strength and massiveness; we are impressed by its dynamic pattern. It is only after our mind has become accustomed to its first impression that we sense there is more to the picture than mere strength and design. Pictures based on design are usually of the cold unemotional type. In their abstract form they appeal more to mind than imagination, but here the artist has introduced a definite emotional note. Contrasting the tiny figure (No. 1 in the diagram below), which is the center of interest, with massive girders and entitling the picture "Vision", is a happy blending of modernistic vigor with romantic sentiment.

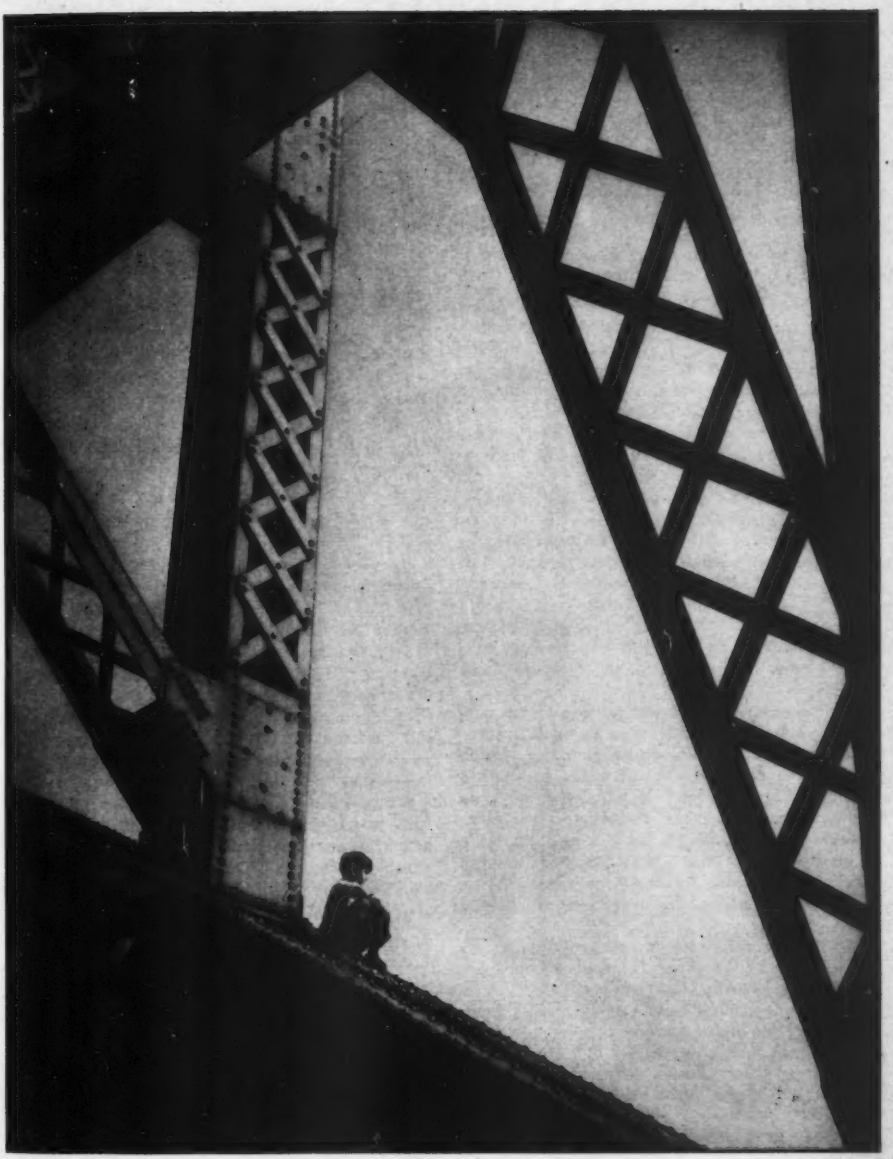
The story behind the picture is easily grasped by the observer because Mr. Muller has wisely kept his picture very simple. It is usually preferable to tell a story in as simple a manner as possible. The less we put in a picture, the more forceful it becomes and the easier it is for others to understand what we are trying to say.



It took vision and imagination to bring forth this magnificent structure. Who doubts for a moment, that some day, this young lad now shaping his bridges in the sky may not actually build them in concrete and steel? But it also required vision on the part of the photographer to graphically portray this in a forceful manner without losing the emotional aspect. Some would be tempted to introduce clouds which might, at first thought, seem to give a greater pictorial interest. It seems better, however, to leave the world unclouded for the youngster on its very threshold, allowing him to write his own story in a virgin sky. Anyway, as Mr. Muller is a "straight" worker, he would no doubt hesitate to add anything which was not in the original negative.

Compositionally, the picture is extremely intriguing. The more we analyze it, the more ob-

* For an understanding of the man and insight into his photographic methods, see the article in this issue, "Let's Make Pictures with J. Ghislain Lootens."



VISION By JOHN MULLER

vious it becomes that the arrangement is not the result of mere chance. Rather, it is a serious study based on triangular rhythm. We have first the largest white triangle, No. 2, which sets the pattern for the rest of the picture. Then, we have the triangle No. 3, which repeats the motif but in a dark tone, giving welcome contrast. We now become aware of triangles Nos. 4, 5, 6, 7; in fact, we run into a maze of triangles wherever we cast our eyes. From the largest areas down to the smallest patches, we note a repetition of pattern. But this repetition, both in area and line, has the necessary variation of size and shape to create emphasis and harmony. Further, the center of interest, No. 1, is correctly kept within the confines of the

largest triangle and placed at the strongest point of the picture, the juncture of the heaviest masses. But, to top it all, even the outline of the diminutive human figure follows the triangular form, thus harmoniously carrying out the basic design to complete finality.

Being Critical

(*Continued from page* 51)

in photography where the miniature camera is definitely the best camera to use.

PORTRAITURE always is the most difficult thing for the amateur—and for the professional, too. That is, if portraiture means the securing of a good likeness. A lot of pictures are being shown as portraits which are nothing but casual snapshots. The only redeeming feature of the average portrait snapshot is a natural expression—a detail of great importance in the portrayal of faces.

In "JOHN" we have a fairly good attempt to achieve a passable picture, but the portrait is not successful due to lack of knowledge as to the proper procedure in both lighting and posing. A good start was made by using the best light source possible, that is, daylight. There is no superior light than that of the sun, but we should keep out of its direct rays or else learn how to control the highlights and shadows.

In this instance, the lower portion of the window should have been blocked up with a cardboard, cloth, or anything else available, which would have confined the direction of light to the top of the window. If you have only one light source, try to make it reach the face from a fairly high position. In this instance, the light should also have been allowed to spill over the nose and touch the left cheekbone, thus approximating the standard 45 degree angle of light.

Because no reflector was used to lighten up the left side of the face, this area is hopelessly underexposed. Any light object—such as a white paper—held a couple of feet away from the model on the shadow side would have thrown back enough reflected light to balance the lighting on the face. Cropping the picture as indicated by the white lines would eliminate the most undesirable portions, leaving us a plain background which is preferable for a serious portrait.

The posing of the head and shoulders is not handled to best advantage. A feeling of action would have been introduced if the body were posed with the left shoulder pointed more towards the direction of the camera. Then the model's face could have been turned to look into the lens. This latter method of posing would have lifted the picture out of the "passport" classification, and yet retained the desired front view of the face.

Law for Photographers, II

(*Continued from page* 49)

turns of the sale, must that agreement be in writing?

A. No, but it is always wiser to have an understanding of this nature in writing.

Q. What are such circumstances that give rise to a subject's possible restraint?

A. If the comment or description printed in connection with the photograph is not fair or is untrue, the subject can seek an injunction. If the subject is a person who is in the public eye and whose pic and story are a matter of public news interest, and the comment in connection with the photograph is primarily intend to inform the readers of the happening of an event, then the subject cannot restrain the publication. Courts have held that people in the public limelight are fit subjects for newspaper stories and photography.

Q. What are the exceptions to this right "to invade" the privacy of an unwilling subject?

A. A non-legitimate use of a pic may sweep aside the publication's news dissemination objective. Two years ago, a well known comedienne posed, mouth wide open, together with a chimpanze. Newspapers widely printed the picture. Although it was an open publicity stunt, there is no question as to the news value of the photograph at that time. Recently, the same actress brought suit to restrain a magazine from reproducing the same picture. She contended that the pic no longer was of current news value and that its present publication was non-legitimate and tended to bring her into public ridicule. There are numerous court decisions that support the now unwilling subject in her suit.

Q. Does the subject have any property right in the picture?

A. Yes, but only if the photographer was paid for shooting the pic.

Q. Under such circumstances, can the photographer use the pic for his own purposes, such as, display in a window, advertising?

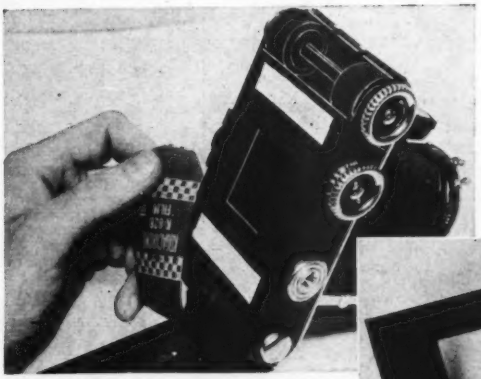
A. No. The permission of the subject must be obtained. Failure to obtain the subject's approval might result in a law suit that would bring a possible substantial judgment in favor of the subject.

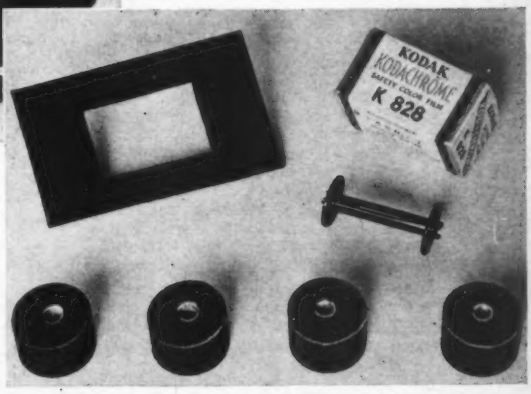
Q. Suppose the photographer shot the picture without the permission or knowledge of the subject, does the subject in either event have a property right in the picture?

A. No, unless the pic is used for a non-legitimate purpose or for advertising. Under such circumstances, the subject has a right to restrain its use and secure damages for its unauthorized use.

KODACHROME *Adapter*

How to use the 828 size roll in larger roll film cameras to make color pictures.





- Loading the camera with color film (above). Fig. 1.
- As Kodachrome roll film is not available in sizes larger than No. 828 (about 1x1½ inches) it is necessary to prepare small wooden discs to hold the small rolls in place in larger cameras. The parts needed, ready for assembly (right) after preparation for any camera is described below. Fig. 2.

By RICHARD W. HUFNAGLE
Illustrated by the Author

MANY owners of high quality cameras using 2¼x3¼ inch and larger roll films have long waited for Kodachrome to be made available in the larger roll sizes. For still pictures it is at present available only in two sizes, one for 35 mm. cameras using perforated motion picture type film, and the other for use in the Eastman Bantam Special camera.

Although Kodachrome has been put out in cut film form for experimental purposes, the marketing of the color film in larger roll film sizes appears unlikely for a long time to come.

In the meantime, anyone can easily adapt his camera to take Kodachrome rolls the size made to be used in the Bantam Special, Number 828, approximately 1 by 1½ inches.

Five easily made pieces allow the use of Kodachrome without preventing the camera's being used for regular black and white pictures. Four of the parts, made exactly alike, merely act as extensions for the small spools and hold the Kodachrome roll in position in the center of the film track. The modified piece is the one used at the winding key and must be slotted to take the camera winding key and also have a small metal pin across the opposite end to engage the Kodachrome spool. The pieces may be seen in Figures 1 and 2, with Fig. 4 showing how they are made and Fig. 5 giving dimensions for cameras using 120, 620, 116, 616 or 118 size roll film.

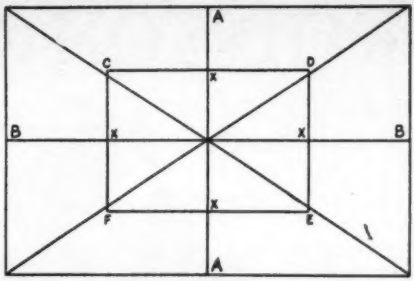
The fifth part necessary is the film mask—a piece of thin metal or stiff cardboard cut to exactly fit inside the opening in the back of the camera, just in front of the film. In this piece there is cut a rectangular opening, centered as shown in Fig. 3, measuring 1⅛"x1⅝", with the 1⅝" dimension running the long way of the insert. This piece, too, is easily prepared. For the takeup spool, obtain an empty 828 spool from some photo finisher or your photographic supply store.

The next step is to mask the finder. Since only the center of the field will be used it is necessary to either mask the finder to compensate for this or be certain that the subject is exactly centered in the finder so that it will be in the picture area. It is advisable to mask the finder as the comparatively long focus lenses give almost telephoto effects on the small size film. To do this, it will be found easiest to mount the camera on a tripod, set the lens at its widest aperture and open the shutter.

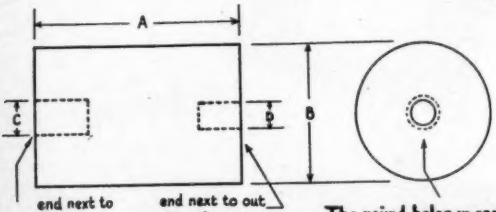
With the cardboard insert held in place in

the camera back by strips of adhesive or scotch tape, use a small piece of ground glass or thin tissue paper to determine the field shown. Then without moving the camera determine where this field is seen through the finder and block out the rest with narrow strips of adhesive or scotch tape.

As a matter of economy it is a wise plan to first load the camera with a 20c roll of 828 black and white film. After exposing each frame develop the roll to see how the actual recorded field corresponds to the masked finder field. This also shows whether loading and winding were properly done. Fig. 1 shows the loading process. The 828 spools are placed in the cameras in the regular way, with the four cylindrical pieces in place on the ends to make them fit the camera. The slotted piece is placed in position to engage the winding key.



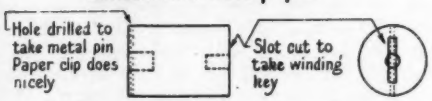
● This mask of cardboard or thin metal to be held in position in camera back with strips of adhesive or Scotch tape. Chart showing how to exactly center rectangular 1⅛x1⅝-inch opening in insert for camera back. Draw diagonal lines from corner to corner. At intersection draw lines AA and BB parallel to sides and ends. Measure 13/16 each way from center on line BB. Measure 9/16-inch each way from center on line AA. Using these points, XXXX, as guides, cut out opening CDEF. Fig. 3.



Four of these needed

The round holes in each piece are to be exactly in the centers and need be only ¼" to ⅜" in depth.

One piece to have slot in one end to engage camera winding key and small metal pin in other end to engage Kodachrome take-up spool



Slot for winding key to be cut to fit individual camera
Small hole for pin to be 3/32" from opposite end

It is obvious that the "red window" will be of no use in winding from one exposure to the next, so the frames must be spaced by the number of turns given the winding key. The "red window" should be covered with a piece of adhesive tape to prevent film from being light struck as it is sensitive to all colors of light. Before closing the camera back, observe the paper leader near the end of the roll. It will be noticed that there are two checkerboard designs across the paper leader. Wind the roll to a position where the last design is exactly even with the adhesive strip which holds the cardboard insert nearest the take-up spool. Fig. 6 (page 81) shows the correct position.

Close the camera and carefully turn the winding key 4½ complete revolutions. The film is ready for the first exposure.

After each exposure, carefully

(*Page* 80, *please*)

● To use Kodachrome film in larger-sized cameras it is necessary only to make discs like the above to lengthen the film spools. Use any good hard wood, sanded smooth and painted black. Fig. 4.

● The chart (right) gives exact dimensions for the above diagram, for cameras using 120, 620, 116, 616 and 118 size roll film. Fig. 5.

Dimensions to fit camera size	A	B	C	D
120	19/32"	31/32"	1/4"	3/16"
620	17/32"	29/32"	1/4"	5/32"
116	23/32"	1 1/4"	1/4"	5/32"
616	23/32"	15/16"	1/4"	5/32"
118	1 5/32"	1 1/4"	1/4"	7/32"

BUILD IT Yourself

LIGHTPROOF CHANGING BOX

By V. H. Wasson

More often than not the amateur dark room is not totally dark until night falls. Or by stuffing and covering it is made more or less safe during day light hours when working with slow films and papers.

Hours spent in the careful exposure of a roll of new film may be lost in the short time it takes to transfer from roll to tank.

An absolutely safe place to load tanks, film holders or film cartridges is easily constructed at negligible cost.

● Two cardboard packing boxes will provide a safe, portable darkroom for loading film, developing, etc.

Obtain from your grocer two corrugated cartons, one measuring about 18 inches on all sides and another which will just slip snugly over it.

Cut the flaps from both so that one side will be completely open. Be sure all cracks are light proof, if necessary re-tape them.

In one side of the larger carton, near the top, cut two holes four inches in diameter and three inches apart. Short sections of four-inch mailing tube about three inches long are forced into these holes and taped in place. Don't spare the tape. Be sure the joint is lightproof. To the shoulders formed by these two sections of tubing are attached elbow length sleeves sewn from heavy black material, pile fabric being the most lightproof.

Provided these sleeves are long enough, elastic in the hems will be unnecessary since the crook of the elbow will effectively prevent light from entering.

For use, the smaller carton is placed open side up on a table and all necessary materials placed in it. Don't forget anything, for once you start, you can't come out, any more than you could open your darkroom door.

Place the other carton over it and push it down snug. Should the inner carton come up high enough to block the holes, simply cut half-moons in it to allow passage for your hands.

Slide your left arm in its sleeve and adjust the sleeve with the right. Now, work the right arm into the box as far as it will go. The sleeve may be drawn up farther by grasping the cloth in the teeth and sliding it up the arm. A tab sewn to the hem makes a good place to bite and keeps the fuzz out of your mouth.

Now, as far as your photographic materials are concerned you're in a totally dark room. As you work you will find that all normal darkroom operations may be executed safely and smoothly, unhampered by the heavy folds of cloth of which the ordinary changing bag is made.

Lastly, it is interesting to note that there is a vast difference in the psychology of working in total darkness and in working where you can see, even though your work is done by touch, with hands and materials out of sight. Just why it should be so is hard to explain, but you will find that your operations will be smoother, faster and executed with increased confidence under these conditions.

FILM WINDER

The economy of bulk film for 35 mm. cameras is dependent on careful handling when loading cartridges. In the darkroom, it is easy to damage film with scratches and body moisture unless it is handled with care and precision.

The bulk film winder can be made from an old pencil sharpener. The first step is to remove the insides and place a bolt—which fits—into its place. The bolt is slotted on the threaded end and cut to length on the other. In some cases the diameter of the bolt on one end will have to be cut down to fit the cartridge.

The sharpener is then fastened on a block of wood as shown and held in place by a metal slide at the left end of the cartridge. When the film is entirely wound on, the slide is loosened and moved away, letting the cartridge pass through the hole.—*Fritz H. Weiss.*

WHAT PAPER *Shall I Use?*

The print—that is what counts in the last analysis. The most perfect negative is meaningless until printed. To get the most out of your negatives, determine (1) suitable surface for each subject, (2) correct paper contrast (3) correct exposure and development.

By JACK POWELL
Illustrated by the Author

"WHAT paper shall I use?" How often this question is asked! One of the greatest stumbling blocks the beginner encounters is the choice of printing papers. The many grades and surfaces seem to be beyond the average worker, yet, anyone can learn to make perfect prints—when the problem is properly and systematically approached.

"What paper to use?" is one of those questions frequently brought to the camera supply store, but it is not the sort of problem which can be solved over a counter.

I have seen delicate high-key studies of little children printed on a rough surface paper such as Eastman's Tapestry, and I have also seen, time and again, strong, low key studies of powerful character heads printed on a smooth white surface, whereas the reverse would be far more in keeping with subject matter.

Fitting paper to each negative and subject is a simple problem.

Many workers use two or three contrast grades of one paper, and feel that it is only necessary to take the degree of hardness of the negative into consideration to get perfect results. This is one step, only. You also must consider the surface of the paper and its relation to the subject.

The purpose of this article is to acquaint the photographer with the different grades and surfaces of photographic papers and the work for which they are best suited. The next problem is choice of developer. A number of formulas will be given with working instructions for producing best results. The formulas are those recommended by the manufacturers for use with each brand of papers, and are the only formulas that should be used.

If you refer to the formulas given with this article, you will see that each developer is specified for use with certain papers. These formulas should not be tampered with, but at times certain changes in the paper developer are necessary and these variations will be explained here.

A black and white print has color and tone, just as has a true color print. It may be weak, flat, muddy looking, or a rich, velvety black with brilliant highlights and pleasing intermediate tones.

The tone and color of a black and white print may be controlled by various darkroom manipulations. The factors governing print quality are:

1—The perfect negative.
2—The type of enlarger in use. (If projection prints are to be made).
3—The emulsion speed of the paper.
4—Surface and contrast of the paper.

A book-length instruction-feature complete in this issue

ATHLETE

Fig. 1

● To bring out roundness and musculature, this print was finished on Eastman Vitava Projection F 2, glossy. The rich black and sparkling high lights of glossy paper cannot be equalled by any other surface for commercial work and subjects like this one.

5—Correct exposure.
6—Developer used.
7—Length of time prints are developed.
8—Proper fixing, washing and drying.
9—Finishing the print. (Trimming, spotting and mounting).

Before considering developers let us first consider the various kinds of papers available.

Four principal manufacturers of photographic papers are, Agfa, Defender, Eastman and Gevaert. Gevaert enlarging papers include Novabrom, Gevaluxe Velours and Artex.

The Agfa Company markets the following: Brovira, Portrait Enlarging, Indiatone, Projection Proof, Convira, Professional Cyko, Nokoline.

The Defender line of papers includes: Artura Iris, Disco, Velour Black, Veltura, Photo-Writ, Velour Black Canvas, Illustro.

Some of the papers manufactured by Eastman are: Vitava Athena, Vitava Opal, Vitava Projection, PMC Bromide, Kodabrom.

The Agfa Broviras are fast enlarging papers, available in a variety of surfaces and contrasts which make them suitable for nearly every type of negative. These papers are manufactured in four degrees of contrasts: Soft, Medium, Hard, Extra Hard.

The surface textures are: Velvet, Silk, Crystal, Porcelain, Antique Royal, Kashmir.

For a normal negative, where it is desired to secure rich blacks and crisp highlights together with a maximum of speed, the medium contrast should be used. The range of a normal paper is so balanced that it will fit into the range of a normal negative — that is, a negative that has been correctly exposed and properly developed.

A normal negative printed on a soft paper will result in a flat and lifeless picture. The same negative printed on a contrasty paper will show a decided loss of highlight detail and a short range of tones.

Using contrasty paper and overexposing will yield a softer print, but this is poor practice.

A negative that is weak or flat requires a print of contrast, so hard or extra hard paper may have to be used. In any case, whether using soft, medium or contrast papers, correct exposure and full development are necessary to secure the right kind of prints.

Figure 5 is a print from a normal negative on normal paper. The negative was exposed in a condenser type enlarger at an aperture of F.8, the time of exposure was twenty-two seconds. The print was processed for three minutes in the standard developer for Brovira paper (Agfa 125). The print is on Agfa Brovira paper, medium contrast.

DEVELOPER FORMULA CONTROL CHART

The ideal negative makes a perfect print on "normal" paper. Print contrast can be controlled by using paper of "soft" and "hard" contrast, etc. In addition, print contrast and quality can be controlled by changing the developer's composition in accordance with the table below. Developer control is especially necessary when working with a paper supplied only in one degree of contrast.

1	2	3	4	5	6	7	8
Water	40 oz.	40 oz.	40 oz.	40 oz.	40 oz.	60 oz.	40 oz.
Metol	15 gr.	15 gr.	45 gr.	80 gr.	10 gr.	10 gr.	35 gr.
Sodium Sulphite	1¼ oz.	¾ oz.	¾ oz.	¾ oz.	¾ oz.	¾ oz.	¾ oz.
Hydroquinone	65 gr.	65 gr.	45 gr.	10 gr.	80 gr.	80 gr.	35 gr.
Sodium Carbonate	1 oz.	¾ oz.	¾ oz.	¾ oz.	¾ oz.	1 oz.	65 gr.
Potassium Bromide	25 gr.	25 gr.	50 gr.	50 gr.	50 gr.	50 gr.	50 gr.

Column 1—Chemicals.
Column 2—For Normal Papers.
Column 3—Bromide Papers of Normal and Medium [Contrast
Column 4—For Soft Results.
Column 5—For Very Soft Results.
Column 6—For Contrasty Results.
Column 7—For Greater Contrast.
Column 8—For Warm Tones. Greater warmth of tone may be had by adding 150 grains of Twenty Mule Team Borax to this formula.

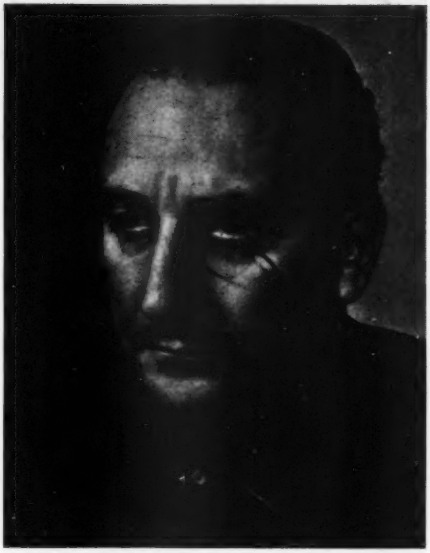
FAIR LADY

Fig. 2

● A delicate high key print (light tones predominate) made on Velour Black C, a smooth white surface. This print would also appear to advantage on a cream white stock or a platinum surface. It would avoid a rough paper.

The print above Fig. 5 was taken from the same negative, but printed on Brovira hard. In comparing the two prints it will be seen that the first retains all the halftones and modeling found in a normal print from a correctly exposed and developed negative. The hard print, on the other hand, shows a decided loss of modeling due to lack of halftones. The contrast range of the paper being less than the tones of the negative, the print looks brilliant and snappy but it lacks intermediate tonal values.

Comparing the two prints, it will be seen that the soft looseness of the light hair has been entirely lost in the second print; the model might have black hair for all that we may know. The delicate tones of the flesh and lips have disappeared and an unnatural hardness has been imparted to the face. Knowing what a charming and naive young lady the model is, it is rather a shock to behold her portrait as depicted through wrong printing on incorrect paper contrast.



DR. PAUL DE RIVER Fig. 3

● Printed on Defender Velour black I. A complete treatise on the varied uses of this paper appeared in the April, 1938, MINICAM, p. 60.

For purposes of reproduction most prints are made on either glossy or matte surface papers. Portraits and pictorial prints, however, are seldom made on glossy paper, rough, velvet, or matte surfaces being more suitable.

A photograph of a child or young lady is at its best when printed on a fairly smooth paper. This is especially true in the case of a high-key study. The smooth surface of the pa-

MISS MATILDA—SEAMSTRESS Fig. 4

● For a subject like the above, for pictorial prints and prints for exhibition, a rough surface is desired. Suitable papers include: Defender Velour Black DD, white rough matte surface; Eastman Vitava Projection W, rough semi-matte, ivory tint; Agfa Portrait Enlarging, Tuma Gas extra rough cream matte, and Gevaluxe Velours.

● Fig. 5 (right) shows a correct print from a normal negative on normal paper. Development was three minutes in Agfa 125, the standard developer for Brovira paper. Exposure in the enlarger was twenty-two seconds at f8.

● The print above shows what happened when the same negative was printed on hard, contrast paper. Comparing the two will show that the larger print retains the half tones and modeling desired. In the print above, the contrast range of the paper was less than that of the negative. The print looks brilliant and snappy but lacks intermediate tones. Note how the soft looseness of the light hair has been entirely lost in the smaller print.

per, undisturbed by roughness of texture, permits a more truthful rendering of the sleek, youthful skin quality, which would be broken up and lost on a rough-textured paper.

A study of an old gentleman should be depicted on a rough paper, with perhaps a slight tone to it.

Fig. 7, "Cathay" study of a Chinese was printed on Defender Veltura Q paper, a medium slow chloride paper having an extra rough surface. Printed in low key and toned a rich brown, the picture became outstanding. Local print control was used in projection. The negative for this print was contrasty, purposely made so by means of contrast lighting and special development, in order to better depict the character of the subject. If the same lighting had been used as in Fig. 5, the result would have been weak and uninteresting, which brings out the fact that it is impractical to use identical lightings for all subjects. In passing I might say that it is better to use as little light as possible for portrait and pictorial studies.

Fig. 1, "Athlete," is finished on Eastman Vitava Projection F-2 paper. This paper was chosen in order to bring out the roundness of the well formed muscles. The rich blacks and sparkling highlights of glossy paper cannot be equalled by any other paper surface and is splendid for all types of commercial work. The body of the model was oiled with liquid vaseline to further accentuate the highlights. Cross lighting on the body further helped to convey the idea of muscular development.

In lighter vein, we have Fig. 4, "MISS MATILDA—seamstress." Pictorial prints of this type may be printed on various papers with equal success. I have made prints of this particular picture on the following papers, with excellent results: Defender Velour Black DD—a white, rough matte surface, double weight; Defender

EUCALYPTUS GROVE

Fig. 6

● Scenic shots provide an opportunity to use papers that are different. To break up sharp outlines and produce the effect of the bromoil or paper negative process, Dassonville Charcoal paper was used, Grade D, rough white surface.

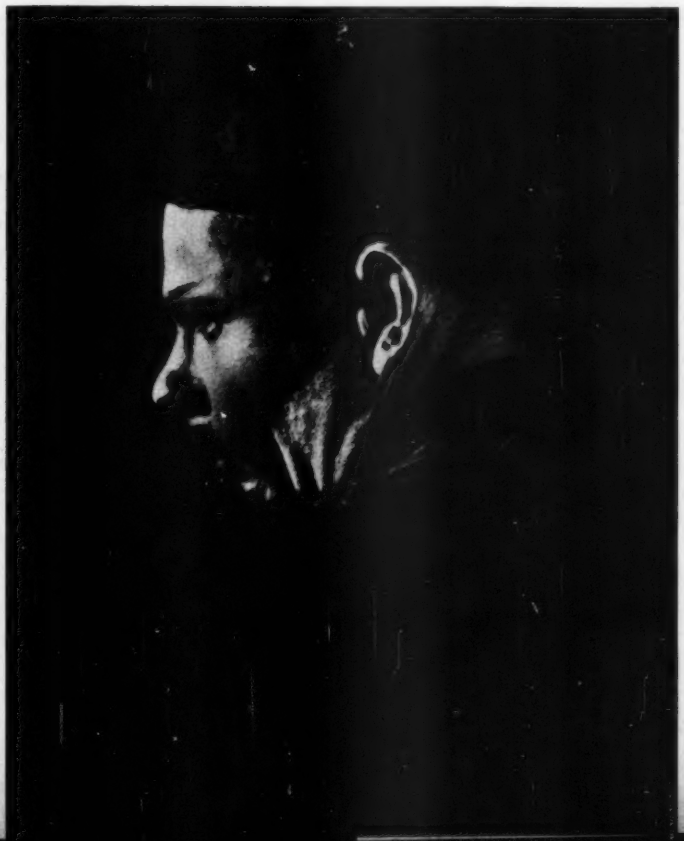
Velour Black I surface, rough matte; Agfa Portrait Enlarging; Eastman Vitava Projection W, rough semi-matte surface, ivory tint; Eastman Vitava Projection D, rough matte surface, white; Tuma Gas paper, extra rough cream matte.

The papers enumerated above all are well suited for making prints for salons and other forms of exhibition. It will be noted that the surfaces are practically all of the rough variety due to the fact that

● Printed on Defender Veltura Q paper, a medium slow paper with an extra rough surface. It was printed in low key and toned a rich brown to better depict the character of the subject.

CATHAY

Fig. 7



prints for salons are usually 11″ by 14″ in size, and a large print can stand a rough paper base.

There are exceptions, of course. Portraits of young people, for example, show up to better advantage on smooth, white, fine grained papers. High key studies should be made on white semi-matte or matte papers, and the texture of the paper should be an absolutely smooth surface, such as Defender Velour Black C, or Eastman Vitava Projection B, a semi-matte, cream white paper; the Agfa No. 205, matte white also answers well for this purpose.

Fig. 3, "Dr. Paul de River," is printed on Defender Velour Black I paper and is reproduced in this magazine from the same paper. The "I" surface is rough matte and may be worked on, using razor blades for etching and carbon pencils for spotting and building up densities. A complete treatise on the varied uses of this paper may be found in the April, 1938, issue of MINICAM under the heading "Retouch and Mount the Print."

I prefer to print head studies of men on the rougher papers and have them go fairly dark, while pictures of the fairer sex are kept lighter. Since we idealize women, place them on a pedestal, so to speak, we should try to bring out this idea in their portraits, and keep the prints in a lighter, airier vein. Men are thought of as being just the opposite, strong, rugged creatures, and so are best depicted in lower key with darker prints. A photograph such as that of Dr. de River may be printed on any of the rougher surfaces mentioned previously. I seldom use buff papers, except when planning to tone a print, and feel it is best not to have too much to do with tinted papers.

Fig. 6. "Eucalyptus Grove," was made on Panatomic film using a G filter and printed on Dassonville Charcoal Black paper, Grade D, rough white surface, a paper similar to Whatman's Drawing Paper. Scenic shots provide an opportunity to give rein to the desire to use papers that are different, papers which break up the sharp outline of the image and produce the effect of bromoils or paper negatives. In this instance, where a Dassonville paper was used, the usual procedure of development was modified to conform with the data as set forth in the Dassonville bulletin, the development was reduced to two minutes instead of three. The print was developed in their recommended Amidol developer (see formula list).

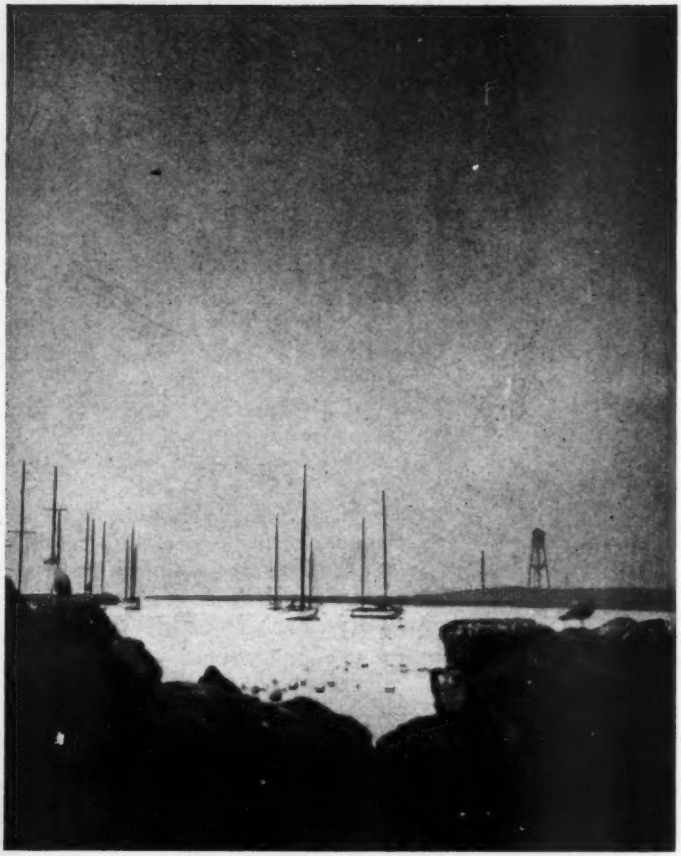
A pictorial scene may be printed under slight diffusion when combined with rough surface papers, the effect thus achieved is soft and pleasing when used at some slight distance.

Fig. 2, "Fair Lady," is an example of delicate, high key work, printed on Defender Velour Black C, a smooth, white surface. This print would also appear to advantage on a cream-white stock or a platinum surface—certainly I would refrain from using it on a rough paper.

THE color, gradations and general quality of prints made with some papers may be controlled by varying the quantities of the different agents of the developer. Papers such as Eastman Opal, Defender Veltura, Agfa Indiatone and other chloride papers, are generally made in one degree of contrast—a rather soft grade—and are so formulated as to give a long range of gradations showing details in both highlights and shadows. This naturally depends a great deal on the negative quality. If the negative is not suited to the paper, that is, if the range of the negative tones does not fit the range of the paper tones, as often will happen, then you must make certain modifications in both exposure and development in order to produce a well balanced print.

Metol or Elon (Veritol, Pictol, etc.) gives softness and delicate detail. Hydroquinone gives density and contrast, so you can mix a developer that will give the softness of metol or the contrast of hydroquinone by varying the quantity of these two agents in the developer solution.

Sodium sulphite is used as a preservative, it has a great affinity for oxygen. It



HARBOR DAWN

● Pictures taken in the fog should be classified as high key and kept light in printing. Defender Velour Black DD, white rough matte, double weight for 11 x 14 prints. For a smaller print of the same, a smooth cream white matte paper should be selected.

keeps the developing agents from oxidizing too rapidly on exposure to the air.

Sodium carbonate is the accelerator. By varying the amount of carbonate in the developer the developing time of the print may be either lengthened or shortened. More carbonate means less developing time, and vice-versa.

Potassium bromide is a restrainer and has a decided influence on the tone and color of the finished print. The addition of a small quantity of ten per cent solution of potassium bromide produces a difference in gradation and color. A large quantity of bromide gives a warm tone and a lesser quantity produces colder tones.

The temperature of the developing solution should be as near 68° Fahrenheit as possible. Lower temperatures will mean slower development; if the developer is warm development will proceed too rapidly. Low temperature will mean more contrast in a print; temperatures above 70° F. will cause the print to develop too rapidly and appear muddy in tone.

Correct exposure with *full* development —and by full development I mean *not less than three minutes*— will produce prints that are uniform and full of quality.

A simple method of ascertaining development time is by means of a three-minute hour glass. Turn the glass over when the print is placed in the developer, and if, after the last grain of sand has passed through to the bottom receptacle, you see that the picture is not fully developed, then you may be sure the exposure was

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under, and longer printing time should be allowed. On the other hand, if the print develops too rapidly and starts turning muddy with uneven brown streaks then the print has been greatly overexposed and accordingly, less time should have been given.

The tone or color of a print may be controlled by the amount of bromide that is added to the developer. The normal amount as given with developers will help produce prints that are rich in quality; additional bromide will hold back development to some extent while increasing development time. The addition of a few drops of the ten per cent solution of bromide (1 oz. potassium bromide in nine ounces water) will keep highlights clear and allow shadows to gain depth. There is, of course, a limit to the amount of bromide that can be used in any formula; an excess will produce olive green tones.

The "Developer Formula Control Chart" on page 60 will help you get the best possible print on a normal contrast paper. It is with some reluctance that this chart is included with the list of standard developing formulas, as it may create the impression that perfect results may be obtained in printing and enlarging merely by juggling with developers. The chart is for use only as a last resort, when the negative is not suited for the type of paper being used. The best quality print is always made from a good normal negative using standard developing formulas in conjunction with careful straightforward printing.

Wherever possible, use without alteration the paper manufacturer's standard formula which is included with each package of paper, such as the following standard developers.

AGFA 125, STANDARD DEVELOPER FOR BROVIRA PAPER

(Stock Solution)

Metol	45 grains
Sodium Sulphite, dry	1¼ ounces, 100 grains
Hydroquinone	¼ ounce, 66 grains
Sodium Carbonate, monohydrated	2¼ ounces, 10 grains
Potassium Bromide	30 grains
Water to make	32 ounces

For use, take one part stock solution to four parts water.

DEFENDER DEVELOPER, FORMULA 55-D

(Stock Solution)

Water	32 ounces
Metol	36 grains
Sodium Sulphite, dry	1¼ ounces
Hydroquinone	144 grains
Sodium Carbonate, dry	1¼ ounces
Potassium Bromide	60-144 grains

For use, take one part stock solution to two parts water.

EASTMAN VITAVA DEVELOPER, FORMULA D-52

(Stock Solution)

Water	16 ounces
Elon	22 grains
Sodium Sulphite, dessicated	¾ ounce
Hydroquinone	90 grains
Sodium Carbonate	½ ounce
Water to make	32 ounces

For use, take one part stock solution to two parts of water. To each 32 ounces of mixture add ¼ ounce of 10% potassium bromide solution.

DASSONVILLE CHARCOAL BLACK DEVELOPER

Water	32 ounces
Amidol	80 grains
Sodium Sulphite, dessicated	240 grains
Potassium Bromide	8 grains

Use full strength. Do not dilute.

The temperature of a developer is just as important in printing as in negative developing. The ideal temperature is about 68° F., although 65° to 70° F. is workable temperature for most papers. If temperature is correct and the developer contains the proper amount of potassium bromide, the first faint image on the paper will appear in about thirty seconds. Development will then continue to not less than three minutes.

If the image appears sooner than thirty seconds and the print starts getting dark in one minute, the print will be developed on the surface only. There will not be any half tones, rich velvety blacks or crisp high lights. Prints must be developed to *absolute finality* in order to bring out their full quality, and this means that development should be not less than three minutes, by which time the chemicals will have acted on every particle of light-struck silver bromide clear down to the paper base. To avoid possibility of fogging, keep paper face down in the developer or at an adequate distance from the safelight.

For the beginner, it is wise to master two, perhaps three, different paper surfaces and stick to them until sufficient practice has been gained to allow experimenting. Many photographers have

(*Page* 71, *please*)

2¼ x 4¼ PRINTS *direct*

FROM 35 MM FILM WITH

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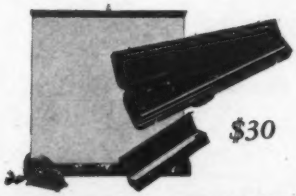
Model B . . . POWERFUL, tri-purpose film-and-slide PROJECTOR . . . 5" focal-length lens . . . triple condensing system . . . Magazine for 500 single or 250 double frames. (With case and carrier, $35.)



$30

ARGUSCREEN KIT . . . CP PROJECTOR, SLIDE BOX AND CARRYING CASE

A clever combination. Adjustable screen 30 x 32, finest material, will not discolor or crack. Gives brilliance, color gradation and depth. (Screen, Case and Slide Box without projector, $15.)

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Contains 24—2 x 2 clear slide glass, 12 binding stickers, 24 film-centering masks (sufficient for 1 doz. slides). 75c.

ARGUS BINDER KIT

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INTERNATIONAL RESEARCH CORPORATION, 213 FOURTH ST., ANN ARBOR, MICH.

A "2x4" DARKROOM

Developing, contact printing and enlarging all can be conveniently handled in the 2 x 4 foot space of a "cedar" closet.

AS with diamonds, a small darkroom is better than none at all . . . . and it's surprising what one can do despite limited space. In some ways, a small darkroom has advantages over bigger ones. You don't have to walk so far . . . . and it is easier to keep clean.

Here is a picture of a "cedar-closet" darkroom; 27 inches wide and four feet deep. You fellows who think you haven't room in your home for a darkroom, figure that space out again . . . . with the connecting hall so narrow that guesswork had to be substituted for groundglass focussing on the accompanying photograph, as you may have already guessed.

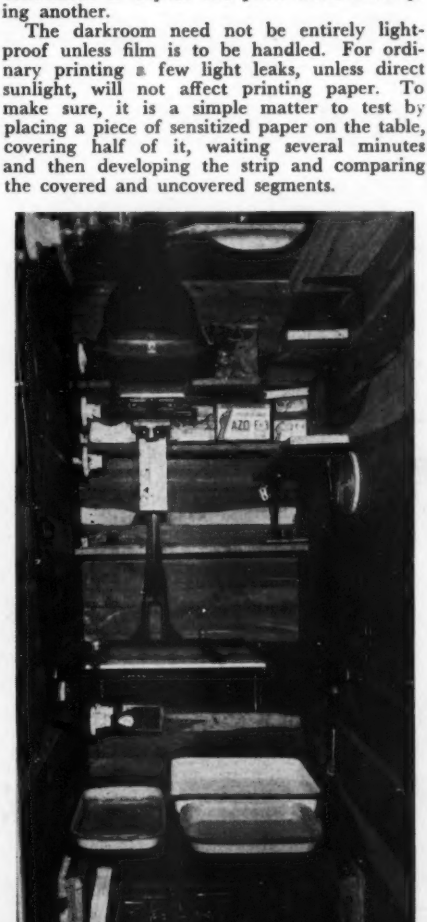
Small shelves on both sides and all around the top carry supplies, gadgets and equipment. Stock solutions are kept on the floor on the right side . . . . and it's easy to wash the workshelves and floor each time used.

All developing is done on the bottom workshelf, which is just the right height when one sits on a small box. Each work-shelf measures 22 inches square. The second work-shelf—at just about table height—is for printing and enlarging, the printing being done on a contact printer, stored when not needed on the floor under the bottom shelf. As our negatives are made with a Speed Graphic and a 35 mm. Weltini, almost all prints are enlargements and a combination enlarger comes in most handy. The 5x7 enlarger takes care of the 4x5s and it takes only a second or two to remove lens and lens-board and substitute the miniature adapter. The photograph shows the printer on the bottom shelf and the enlarger with its adapter for 35 mm. work.

A second-hand sink and running water is to be installed on the bottom shelf. A closet darkroom is ideal from heating standpoint if it opens on a central hall which means comfortable heat in the winter. In the summertime, a ventilating system is easily worked out. One thing only were we extravagant on and that was an abundance of electric outlets and they have paid dividends on temper as well as time saved.

An efficient darkroom may be built almost anywhere with a little planning. The first necessity is electric current. The second, running water, may be dispensed with if absolutely necessary. The use of developing trays on a shelf below the enlarger, as shown here, permits a great saving of space. Even when plenty of room is available, it is desirable to have the processing trays near the enlarger so that it is convenient to expose one print while developing another.

The darkroom need not be entirely lightproof unless film is to be handled. For ordinary printing a few light leaks, unless direct sunlight, will not affect printing paper. To make sure, it is a simple matter to test by placing a piece of sensitized paper on the table, covering half of it, waiting several minutes and then developing the strip and comparing the covered and uncovered segments.



● **In this compact darkroom, developing is done on the lower shelf where the trays and safelight are seen. The enlarger, with its 35 mm. adapter, handles negatives from that size up to 5 x 7. When contact prints are desired, the enlarger is moved up and the contact printer (seen on the floor) is put on the main work shelf.**

What Paper?

(*Continued from page* 68)

adopted this procedure. They produce one type negative and use one type paper, and achieve splendid, consistent results. One student, for example, uses a Leica camera and makes 11″ by 14″ prints on Defender Velour Black I, normal grade. All negatives must be of normal contrast and this student spends infinite time correctly lighting each subject. Exposures are made under the guidance of a Weston electric meter. Negative development is carried on under strictly temperature controlled conditions, using distilled water and fresh chemicals. Finally, if a negative happens to be too dense, contrasty, or flat, no attempt is made to print it. The picture is retaken.

Under these conditions a single paper surface and contrast may well be used for all negatives; although there are many who prefer to take advantage of all the different paper surfaces at our disposal and choose the one which will best portray the negative image. What I have said about mastering two or three papers is also applicable to negative material.

The idea behind this suggestion is twofold: from the standpoint of practicality there will be an ultimate saving of time and expense; while from the artistic viewpoint complete familiarity with our working tools will enable maintenance of a high standard of quality.

"Sandblast"—Graflexed by J. H. Reynolds, Ottumwa, Ia. Data: Series D Graflex camera; f.4.5; 1/1000 sec.; Super-Sensitive Panchromatic film.

Closeup Lenses

(*Continued from page* 25)

ing cloth. Move the camera back and forth, keeping the back parallel with the cover of the book until the image which shows on the tissue paper is sharpest. The lens should be wide open at this time, with the shutter set on time.

When the sharpest point is determined, being very careful not to disturb the camera or move the book, take a tape measure and find the exact distance from the front of the lens to the cover of the book. Make a note of this distance and then reset the focus of the camera for its shortest working distance, such as three feet. Again move the camera toward the book until the image is sharpest. Measure this distance and note it. You are now aware of the working distance of your new combination, but you still do not know the field covered at each distance.

Easiest way to determine the field is to set up the camera on a tripod equipped with a tilting attachment and point the lens straight downwards, as in the illustration. The height above the table should be adjusted by means of the tripod legs until the correct working distance is arrived at. That is, if the new lens makes it possible to work at fifteen inches when the camera is focused at infinity, then the lens should be fifteen inches above the top of the table.

Rule off a sheet of white paper into one inch squares and make a mark to indicate the center of the sheet. Hold a weight on the end of a string exactly under the center of the lens and move the paper about until the weight hangs over the center mark on the paper. Now take the focusing cloth and hold it over your head so you can see the image on the tissue paper and count the squares each way. This gives you the exact field included at this distance. Set the camera at the close distance and adjust the tripod height again. Repeat the operations and you will have the field for the closest working distance.

If, however, you know the focal length

of your supplementary lens, you can focus by means of the scale, Fig. 3. Let us say you are using a 20 cm. (8 inch) supplementary lens.

Set the camera scale at the infinity mark. At what distance from the camera is a subject in focus? Place a ruler or straight edge on Fig. 3 from the "20" in the "focal length" column to the "infinity" on the column marked "camera scale." The ruler then will cross the middle scale at 20 cm. (approximately 8 inches) the distance the subject should be placed from the camera lens for sharp focus.

In this way, (1) the camera scale setting, (2) the distance from camera to subject, or (3) the focal length of the supplementary lens to be used can be determined if two of these three factors are known.

When measuring distances from the center of the lens, measure from the center of the lens system which usually is at the iris diaphragm.

Now *how* does a supplementary lens work? You might have noticed from the above example that when the camera lens is focused at infinity, the addition of a supplementary lens brings the camera to focus at a distance from the camera lens equal to the focal length of the supplementary lens. For example, if your camera lens is set at infinity and you add an eight inch supplementary, the camera will then be focused sharply for eight inches. It makes no difference what the focal length of the original lens may be.

In Figure 6 we see the conditions for a lens at infinity; rays of light which are

parallel enter the lens and are focused on the film. This is the normal condition

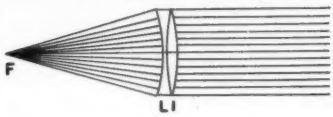


Fig. 6.

for infinity. In Figure 7 we see a supplementary lens of thirty inch focal length placed at a distance of thirty inches from an object at "o." The rays of light from "o" diverge, strike the lens and are rendered parallel.

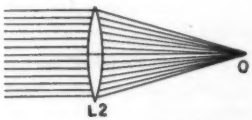


Fig. 7.

Now let us combine the two lenses in Figure 8. Here we have the object at "o" sending its diverging rays to the supplementary lens L^2 which renders them parallel. The parallel rays emerging from L^2, fall upon the camera lens, L^1, just exactly as do the rays of light from an infinite distance. L^1, the camera lens, brings these parallel rays to a focus at the point F, just as it did for objects at an infinite distance. Thus we see the

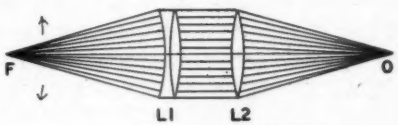


Fig. 8.

reason for the fundamental of all work with supplementary lenses, namely that with the camera lens at infinity, the addition of a supplementary lens brings the entire system to focus upon an object whose distance is equal to the focal length of the supplementary used.

ENLARGING HINT

A portrait attachment used on your enlarger lens permits larger prints to be made without raising the lamp house. The effect of the supplementary lens is simply to decrease the focal length of the enlarger lens.

Vacation Pictures

(*Continued from page* 18)

wind, a smokestack red-filtered against clouds; a deck-hand coiling rope; a steward walking against the wind.

FLOWERS: Buds or blossoms. Trees against sky or leaning over water. Lily pads. Fallen leaves floating on the pond.

REFLECTIONS: Bridges, the town, a tree, a canoe. Reflected in the ocean, the river, or a puddle of rain-water.

SILHOUETTES: Your companion, a tree, or a mountain. Against the sun (rising or setting), the sky or the water.

BEACH SCENES: Ashore, swimming, or diving. Sand with or without water. Waves on sand or against rocks. Pretty girls. Beach games and water sports. Surf fishing.

FISHING: Close-ups, action shots. In foreign places, natives. In commercial fishing ports, nets, workmen, old dories, fish.

HISTORIC PLACES: Include famous points of interest.

PICTORIAL SCENES: Landscapes, clouds, roads, hills, desert scenes. Picturesque buildings. Sunset. Fog. Rain.

CHURCHES: Shrines, temples, steeples, church bells, church festivals, native visitors at shrines. Interiors and exteriors. Stained glass windows against sunlight. Get permission first and be safe.

RAILROADS: Modern streamlining. Close-up of driving-wheels and steam. Interesting railroad men. "Puffing around the bend." Tourist who "just missed it." The observation platform.

RAINY DAY SCENES: Get the glisten of water on streets and trees.

VACATION SPORTS: Tennis, pingpong, golf, pinochle, gossip, love.

Suggested Scenario for Boat Trip

1. The passport arrives. (Self-portrait, eagerly ripping open official-looking envelope.)
2. Buying the ticket.
3. Packing. (A little humor, please. Six people sitting on a trunk in a futile effort to close it.)
4. The friends who saw me off. (Doing things, not just posing.)
5. The crowd on the dock. (Long shots and close-ups.)
6. We're off. (Close-ups of the steamboat-whistle with steam pouring out; a dock-hand throwing the hawser aboard; and a tugboat nosing the liner away from the dock.)
7. My stateroom. (Photo-flood in the lamp-fixture for light. Camera on tripod outside door, due to lack of space.)

8. Down the bay. (Many long-shots and close-ups.)
9. Fun afloat. (One-shot—or one thousand.)
10. Land ho!
11. Through the customs, etc.

Scenario for Camping Trip

1. Packing. (Self-portrait with knapsack, sleeping-bag, four cameras—borrowed from friends for the picture—and can of foot-powder in the foreground.)
2. The open trail. (Tripod, yellow filter.)
3. Clouds over Mt. Baldy. (Yellow filter or red.)
4. Climbing Baldy. (Series of action shots. Remember that good "candid" shots are not sneaked, but posed to look just right.)
5. Resting. (Low viewpoint, silhouetting your buddy against the clouds, with red filter for dramatic effect. Take exposure-meter reading close-up against subject, to eliminate sky from reading.)
6. Water! (Extreme close-up of buddy's face, cup tilted high, water trickling down over parched lips.)
7. Pitching camp. (A series on this.)
8. A bear visits us.
9. Assembling the foldboat. (A series), etc., etc., etc.

Cold Light

(*Continued from page* 30)

sion" cable or wire such as is used to connect spark plugs in automobiles is suitable. The transformer should be mounted so that these wires should be as short as possible and free from abrasion that would wear off the insulation and expose bare wire to metal parts. If the cable wears through at any point near metal a spark will result, because even the small transformer is capable of producing a spark perhaps an inch long. The secondary wiring should be well insulated.

Touching the bare wiring leading from the transformer to lamp house will cause an unpleasant shock, but there is not enough current to hurt anyone, so it is not dangerous.

The enlarger should be equipped with condensing lenses, but if these are not in the enlarger at the present time, you can make use of one or two plano-convex lenses which can be picked up quite reasonably in photographic or salvage stores. The use of the lens in conjunction with

the gas tube is similar to its use with the frosted enlarger bulb, that is, it acts, not as an optical condenser, but as a mixer. It will be found that the raw gas tube will show a trace of its pattern on the easel and in some cases this pattern is sufficiently pronounced so that an ordinary diffusing glass will not iron it out, but, the addition of one or two condensing lenses will so mix the light that a perfectly uniform light field will be obtained.

To adjust for even illumination, remove the negative from negative carrier and move the light up and down until the most even illumination is obtained on the easel.

A "Neon" tube requires a minute or two to heat up when it has not been lighted for a day or so. It will light, but certain parts of it may not be of as high intensity as others, so it is always a good idea to turn the tube on and permit to burn for four or five minutes preliminary to the actual enlarging. After this has been done, the tube may be turned off and used with a manual or automatic switch just the same as an incandescent light. The tube ignites instantaneously and there is no after glow when it is extinguished so that the actual time of applied current is the time of illumination.

Once a cold light is actually put into use, very few amateurs—or professionals—will go back to the hot and inefficient Mazda bulb. In addition to the economy of the cold light which will amortize its own cost within a year in the hands of the average amateur, the resulting enlargements have a very definite increase in quality which would make the cold light highly desirable even if it represented an increase in operating costs instead of the actual decrease. Cold light undoubtedly is the enlarger light of the future.

Keep It Simple

(*Continued from page* 48)

rhythmic variations most of which repeat the oval shape. This is particularly true of the water directly in front of the swans.

The print's composition is essentially

simple, being a light mass against a dark background. Detail in background or foreground is not needed.

Simplicity was a virtue well-appreciated by the classic Greek artists. They were not photographers, but held pretty closely to this formula and wound up with a fairly handsome collection of statues and other works of art. But then, they were primarily interested in the human figure which is the ne plus ultra in repetition with variation. Human figure —hmmmm. That might be something!

What Is Tone?

(*Continued from page* 22)

roundness than any of the other examples noted.

The lighting here is from one side, as in Fig. 7, but instead of filling up the dark area with a light on the other side, as we did in Fig. 8, we use as a secondary illuminant a light from the front, as in Fig. 9. However, this front light is weaker than that used in Fig. 9; also, it is placed farther back and carefully arranged as to intensity so as to obliterate the cleavage caused by the dark shadow band seen in Fig. 8. The result is a continuous gradation from highlights to shadows without definite breaks in tone contrasts.

Tonality in photography may be defined as the degree of "lightness" or "darkness" reflected from various parts of an illuminated subject. These factors of light and dark reflections depend on the strength and color of the light used, as well as its direction, and also on the capacity of the subject to reflect light. Different materials and colors reflect light in varying intensities, and it is necessary to take this factor into consideration in properly lighting a particular subject. A complete discussion of this subject, together with a comprehensive list of the reflecting capacities or coefficients of reflection, as they are called, of a number of familiar materials and colors, is included in a forthcoming book, "Lighting Ideas in Photography," by William

Herrschaft, an illuminating engineer, and the present writer.

A typical step wedge showing different tones is shown in Fig. 2. You can make a similar one for yourself by placing a sheet of sensitized paper under the enlarger, remove the negative from the enlarger and expose each section by uncovering part at a time. Double the exposure in each case. When you have come to the end, you will have a number of tone bands, each one exposed for twice the time received by the succeeding one. A masking device consisting of a sheet of glass covered with black paper will assure an even edge.

An enlarger is not necessary. The step wedge can be made under any light. The number of steps is immaterial.

The use of the step wedge printed as part of this article or one you make yourself will aid the identification of tone differences in prints. The wedge can be placed on a print and tone areas identified by number as in Fig. 1.

A scientifically graduated step wedge may be purchased in a photo supply store for about ten cents, but any numbered tone scale is suitable for the purpose explained here—to view prints in terms of tone values, highlights, shadows and middle tones, and to evaluate the various areas of a print in relation to each other.

Hot Weather Hints

(*Continued from page* 45)

using formalin may be used with good success.

Very popular is the following hardening short stop.

SB-4

Water	32 oz.
Potassium Chrome Alum	1 oz.
Sodium Sulphate	2 oz.

Immerse films for 3 minutes and agitate.

The solution when freshly mixed has a blue violet color. It turns yellow green with use and should not be over worked. The unused bath will keep indefinitely but once used, the hardening properties begin to fall off rapidly.

Films hardened in the above solution will withstand washing in relatively warm water and therefore is recommended for use even with films developed at normal temperatures, especially if the wash water is warmer than 70°.

Book Reviews

MINIATURE CAMERA WORK, edited by Morgan & Lester, 303 pages, 500 illustrations, 20 color photographs. *Morgan & Lester, Publishers.*

"No, this is not another picture book," says the eloquent introduction to the book. "Neither is this a photographic manual with more of the standard formulas and well known technical information. The average photographer has already been supplied with sufficient technical knowledge. It is not the process for the mechanism behind the photograph that holds back the work. Thousands are producing technically fine work but few are making real pictures. What is the reason?"

"Great changes have taken place in the past few years. Photography, too, has changed, for surely in this great world-eruption photography could not remain in its old sentimental rut. Great changes have produced new viewpoints, new life and new overtones. These pages attempt to draw the curtain aside and show what ideals lie behind the new photography.

"Pictures may be born in a darkroom developing tray, but they are conceived through perception and understanding. Technical knowledge is only a small part of photography. There are more important things that go to make the modern photograph and these things and a clear understanding of them is now attempted for the first time."

Included are articles on photographic journalism, formal and informal portraiture, sport and action photography, color photography, composition in photography, photography of children and pets, photo montage, news photography, surrealistic photography and a chapter of technical data compiled to give standard formulas, tables, and other handy darkroom information.

Kodachrome Adapter

(*Continued from page* 56)

wind the key the following distances:

After	1st	exposure,	wind	1⅛ turns
"	2nd	"	"	1½ "
"	3rd	"	"	1½ "
"	4th	"	"	1¼ "
"	5th	"	"	1¼ "
"	6th	"	"	1¼ "
"	7th	"	"	1⅛ "
"	8th	"	"	12 " or until

film is all wound up on the takeup reel.

Regardless of the size camera, the same number of turns of the winding key are used to space the pictures on the film!

Film should be wound only when the bellows are extended. There is danger of scratching the film if it is wound with the bellows in folded position.

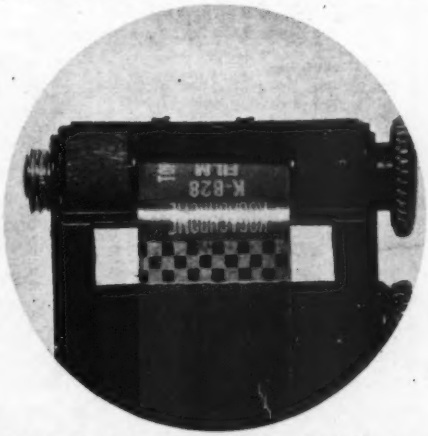
The above indicated turns will space the film so that there will be no overlapping of exposures on the roll. If desired, 1½ turns may be given all after number one. This will

allow only seven exposures to the roll instead of eight.

Complete information is available concerning exposures on Kodachrome, also see the article, "How to Expose Kodachrome," in MINICAM for July.

Finishing is done by the Eastman Kodak Company and the roll should be sent to them immediately after it has all been exposed. Instructions for this are enclosed with each Kodachrome roll. The cost of processing is included in the original price of the film. (Number 828, list price $1.75.)

When the processed film is returned, if exposures have been reasonably correct, the seven



● Load the camera and wind the roll of film to a position where the last of the two checkerboard designs across the paper leader is exactly even with the adhesive strip which holds the cardboard "mask" nearest the takeup spool as shown above. Fig. 6.

or eight pictures (transparencies) in full color will provide a new thrill for the cameraist. These are best seen when cut apart and set in viewing holders, or better still, mounted in 2x2 glass slides. These slides may be projected in the full brilliance of their living colors by any of several reasonably priced projectors now on the market. The transparencies are grainless and in a darkened room may be projected to almost life size with good brilliance and fine detail.

How to project your color pictures—and also black and whites—will be described in MINICAM *next month.*

Why Filters?

(*Continued from page* 37)

most white with this filter.

What filters are used for extreme contrast? The dark "X" filter gives quite a high contrast, but the greatest is obtained by a heavy red filter because it eliminates the blue light of shadows.

Are filters of practical value? Yes, the correctly filtered shot has a balance, a tonal quality and pleasing contrast which makes its superiority apparent.

In the accompanying photographs, note the change in contrast and detail. The unfiltered shots have the greatest detail and the filtered ones the greater contrast, particularly noticeable in the shadows.

When should use of filter be avoided? When there already is adequate tone contrast in a subject and when maximum sharpness and detail is desired.

Why is the effect of filters most apparent in color charts? The chart has definite colors arranged in progressive order so that the filter effect is obvious. The same effect is to be found in all filtered shots if the subject is studied.

What is the difference between the various degrees of color, such as light, medium or dark yellow? The filtering effect is proportionate to the depth of color. Any filter which has a depth of color sufficient to make it of any value, requires an increase of exposure. This is to compensate the loss of light in the filter. The increase is known as the *filter factor.* The factor for any filter changes with each change of film and light. The most dependable filter factors are those given with each roll of film.

Why do yellow filters so often show no effect on the film? (a) The filter is too light. Very light yellow filters are practically worthless with modern films. If a filter is to be used, one should be used which is enough to produce a visible effect. (b). The exposure is too long. Most medium filters and even some heavy ones in the yellow color require only a two-times increase in exposure with modern films. Greater exposure will eliminate the effect of the filter by passing too much blue. Yellow filters must be used on the verge of underexposure if they are to show their effect.

Can colored cellophane be used as a filter? No. While cellophane may be used to good advantage in filtering *color films,* its color is much too delicate to have any real value in black and white photography.

Theatrical gelatin, however, is as cheap as cellophane and makes good filters for occasional use.

Are gelatin filters satisfactory? Gelatin filters are excellent as long as they are carefully preserved. The filter must never be touched by the bare fingers as indelible marks will remain. As a rule a gelatin filter can be used six or eight times before it must be discarded. With extreme care, gelatin filters may be preserved for months, but most amateurs consider the trouble too great to offset the saving over glass filters.

What factors should be used with the yellow, yellow-green and red filters? As stated this is best determined by experiment, but as a suggestion, try these factors:

	Orthochromatic film	Panchromatic film
Yellow filters	2x	1.5x
X1	4x	3x
X2	6x	5x
Light red	— (50x)	4x

Example: With yellow filters and ortho film, the factor is 2x and exposure therefore is doubled.

With some light red filters and some orthochromatic films, factors of from 20x to 100x will give good printing negatives. This must be determined for your film and filter by trial.

As a rule factors for yellow and red filters are *less* for artificial light than for daylight.

IN THE charts it will be noticed that red, green and violet are called "plus" or positive colors. These correspond to the three divisions of the spectrum. The three filters used in natural color photography are of these three colors. Each represents a specific division of the spectrum, approximately one-third of it.

The minus colors are so called because they represent the full spectrum *minus* one comparatively small portion. For example if the blue is removed from the full spectrum, the remaining mixture is yellow. This means of course that yellow is a mixture of red and green, a fact familiar to all students of color. Likewise, if the green is removed the mixture of blue and red will produce magenta while the mixture of blue and green resulting from the subtraction of red will produce cyan blue.

The term "minus color" is a short way of stating "White light minus ——;" for example, "White light minus blue" is yellow. But for the sake of brevity we indicate yellow simply as "minus blue."

Cyan blue (minus red) ; yellow (minus blue) and magenta (minus green) are the colors used in *printing* natural color. Cyan blue is used with the red filtered negative, yellow with the blue negative while the green filtered negative is printed in magenta.

Caverns and Cameras

(Continued from page 33)

the world. A former state geologist once said that there were more than ten thousand miles of caves in Kentucky, but this probably is a gross exaggeration. Other parts of the country where caves may be found include: Southern Indiana, where the two best known are

Wyandotte, originally called "The Mammoth Cave," and Marengo Cave, a small, but decidedly beautiful cavern. Located in the Shenandoah Valley of Virginia are many caves, but these are small as compared with some of the others, although they are well known for their formations, with Endless and Luray Caverns topping the list.

Similar honeycombed formations extend under large parts of Tennessee, Missouri, Arkansas, South Dakota, and the Southwest around Carlsbad Caverns National Park, New Mexico.

A tripod is a very desirable accessory. It will enable the making of time exposures and also facilitate the framing and exposing of flash shots. Flash pic tures, however, can be taken without a tripod.

A flash synchronizer is desirable, but not absolutely necessary. As most cavern pictures are made in relative darkness, "open flash" can be used with perfect success even with the camera held in the hand. The shutter is set for "Bulb" or "Time." When ready to shoot, the shutter is opened, the bulb is flashed and then the shutter is closed.

The writer prefers flashlight powder to flashlamps for a number of reasons such as the fragility of bulbs and their lower illumination value.

The smokeless flashpowder is the best because the other grades, although giving better illumination, are apt to fill a room or passage with smoke and make the next shots hazy.

Some caves are wired for electricity. Taking photographs in these is a simple matter when a flood lamp is plugged into the cave's electric sockets. Incidentally, this is about the only method by which the subject of an underground picture can be accurately observed in a groundglass. When using either type of flash material—lamp or powder—the grouping must be "spotted" with a hand-flashlight or candle by holding it at the top, bottom and each side of the desired photograph.

The spot of light made by the apparatus may be seen in the finder or groundglass, but only floodlamps will show an entire scene.

An unusual picture may be often secured if the flash is placed at a distance ahead of the camera, providing it is behind some object large enough to prevent direct rays from entering the lens. Backlighting will yield exceptional pictures. The writer, as a rule, uses two flashes, placing one to each side and slightly *behind* the camera.

The flashes need not be set off at the same time. If the camera is on a tripod in a dark cave, you can open the lens and leave it open for many minutes while you walk around setting off flashes. Or you may walk around with a flood bulb on a long cord. In the latter case, it is necessary to determine from flood bulb tables how many seconds or minutes exposure will be required. Then count the number of seconds that the flood bulb is on. It can be turned on and off as you move to the various parts of the cave.

A pocket searchlight used to help you find your way around will have no appreciable effect on the exposure in the above cases.

By the time one has advanced to cave photography he learns not to watch the flash. Deep pits, sharp rocks, low roofs, or sheer walls are not to be trifled with while one is momentarily blinded.

When possible, measure accurately the distance from the principal object of the picture to your camera. Of course, there are times when this is impossible unless

one can float in air over a huge crevice, or an underground river.

In this connection, one of the difficulties of good cave photography may be mentioned: Because of pits, piles of fallen stones, etc., you will not always be able to consider your subject from all angles. Naturally, it would be a very poor subject indeed that did not merit some preliminary study before the shutter is moved. Therefore, if only to safeguard against hasty decisions that may not even be worth printing, look carefully around for the best angle before shooting. In order to get that "certain angle" you may have to work yourself into some strange positions at times, but the results are worth it.

Suppose you are about to shoot a cave scene. You place the camera on a firm support, such as a tripod or rock, then focus it by whatever sort of "pre-flash" lighting you are using. Having found your grouping satisfactory you then increase the depth of focus by stopping down the lens. Now, with everything, and everyone in readiness, make sure all lanterns, candles and other lights are either out or beyond the picture. Not until then, caution any uninitiated persons to remain quiet, open the shutter, and set off the flashes.

In determining exposures from flood or flash bulb tables, be sure to take into account the size of the room, and the color and light reflecting ability of the walls. Black, light-absorbing walls require increased exposure. White, moist light-reflecting walls permit less exposure. In addition, the smaller the room the less the exposure required. Take into account height of ceiling as well as width of room.

For the fascinating, unknown picture subjects, try the animal life of caves. This includes bats, eyeless fish, blind crayfish, and the several species of salamanders, spiders, mites and crickets.

The fish, which are almost transparent, and the crayfish, have been living in the total darkness of caverns for so long that all trace of external eyes have been lost. Most of the other animals have imper-

fectly developed optics, but, in time, probably will lose them as have the aquatic species.

If exploring a cavern "on your own hook," go prepared with plenty of extra light, and make certain that you know the proper directions when reaching a spot where several passageways branch off. The old one about carrying a ball of twine and paying it out behind you is utterly foolish. Keep your directions by chalk marks and natural formations.

For the thrill and satisfaction of exploring the mysterious and unknown, locate a cavern and take a camera, pan film, pocket searchlight, tripod and flash bulbs or flash powder. In addition, if your subject is one of those "civilized" caves with electric wiring, be sure to include several flood bulbs.

Photography TRADE NEWS

ROBOT OMEGA ENLARGER

INTERCONTINENTAL Marketing Corporation, distributors of ROBOT cameras and accessories, and Simmon Brothers, manufacturers of Omega Enlargers, announce a new enlarger to be known as the ROBOT Omega. The ROBOT Omega is similar in every respect to the Omega Minature enlarger finding such favor for users of double frame negatives, except that it carries a built-in mask to the ROBOT square format. The specially designed illumination and projection system which has made Omega enlargers so popular is admirably suited to the ROBOT negative, retaining the full sparkle of the shot even in extreme enlargements. The film is held in the focal plane by spring pressure applied to the perforated edges. Condensers and diffusion disc are quickly removable for cleaning. Enlargements up to 16 times linear are possible on the baseboard, while much larger prints may be made by projecting on the floor. The lamphouse is cast aluminum and radiates heat so effectively that there is no possible chance for damaging film or lens.

The enlarger is securely mounted to the baseboard, eliminating all chance for vibration. A steel tape in an enclosed spring reel counterbalances the projection unit. The ROBOT Omega is made for alternating current. With a 2" f/4.5 Simon Enlarging Anastigmat, the ROBOT Omega sells for $63.00. With 2" f/3.5 Simmon Anastigmat, for $68.00. Equipped with 2" f/4.5 Dallmeyer Enlarging Anastigmat, for $78.00. Also available will be a ROBOT Omega with Bausch and Lomb Micro Tessar. For further details, write Intercontinental Marketing Corporation, 8 West 40th Street, New York City.

THE MICRO-LITE PRINTOMETER

THE RESEARCH Engineering Company, 310 South Michigan Avenue, Chicago, now announces the Micro-Lite Printometer.

This is an electric photometer designed to determine accurately and without any calculations or estimations the correct time for any type of negative—for any type of paper—and for any type of printing (projection or contact).

The Printometer is used directly on the printer or

on the easel and is capable of measuring the light intensity over a very small area. This fact automatically compensates for the size of the print, the intensity of the printing light and for the relative density of the negative. A sliding dial compensates for the variation in the speed of the paper.

Since the Printometer measures the light intensity at any particular point it may be used to determine the degree of contrast of a negative. This is accomplished by determining the relative intensity of the light passing through both the thin and the dense portions of the negative. Having arrived at such a contrast factor the proper paper for making a perfect print is at once known by referring to the tables accompanying each unit.

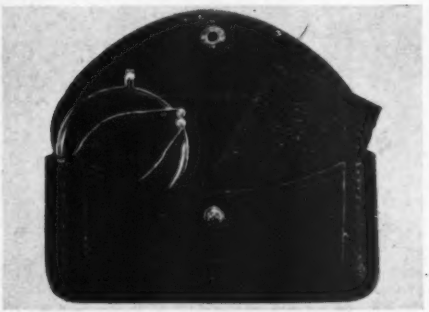
The unit comes complete with full instructions for use including a table indicating the "Speed and Contrast Indexes" for 39 different photographic papers.

It is made in the U. S. A. and priced at $12.50.

CHROMOPLAN FILTER SET

G. GENNERT, INC., 20 West 22nd Street, New York City, and Los Angeles, announces that they have taken over the distribution of Precision Improved Filter Sets made of optical glass.

In this set as in the Chromoplan Filter Set all the filters are made of optical glass colored "in mass" and spectroscopically tested.



The Precision compact filter holder is used exclusively as this has proven the most practical filter holder. It is adjustable to smaller lens hoods.

The Improved Chromoplan Filter Set consists of the following filters together with one Precision holder of the specified size and is offered in 4 sizes:

No. 0 for lenses 25mm. (1 ″) diameter
No. 1 for lenses 31mm. (1¼″) diameter
No. 2 for lenses 39mm. (1½″) diameter
No. 3 for lenses 51mm. (2 ″) diameter

No. 1 Yellow Filter 2x
No. 2 Yellow Filter 5x
No. 3 Green Filter 3x
No. 4 Red Filter—Filter ratio according to negative material.
No.5 Blue Filter—Filter ratio according to negative material.

Prices of Improved Chromoplan Filter Sets:

Size No. 1 31mm. (1¼″) diameter.....$6.00
Size No. 2 39mm. (1½″) diameter.....$7.50
Size No. 3 51mm. (2 ″) diameter.....$8.50

The price includes the soft leather pouch and band for holding filters and protecting them against breakage when carried in the pocket.

CINE FILTER SLIDE

VOLUMES could be written about photographic filters and their uses. Their salient advantages however, are easily described. Filters bring out tonal values and detail, capture the beauty of cloudland and create effects that cannot be obtained with photographic lenses alone, regardless of their precision or their color correction. They register the true values of light and shadow, gradations of light, the merest pinpoints of luminosity and record the fine granularities in snow with microscopic fidelity.

While every type of filter serves a specific and particular purpose—yet it is evident that the movie maker finds himself thoroughly confused by an array of filters of every shade and color and wonders whether he requires a long and protracted course in their use.

If he has but one or two filters, he finds himself

handicapped when striving for results that these cannot possibly achieve. Should he use every type of filter that is suggested, he discovers that a new complicating factor has been added to a hobby that should be simple and pleasurable.

Five basic filters will amply provide for every important contingency that confronts the movie maker, will compensate the characteristics of film emulsions in widest use and enable him to portray his subject as it actually should be shown. A minimum of five filters then is essential. When one considers that in movie making the nature of the subject changes momentarily from this color to that—from landscape to seashore—from activities on a sand-colored sports ground to deep green foliage and woodland.

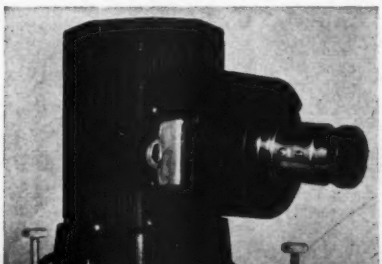
To remove a filter from a lens mount and to substitute another does not make for added enjoyment in this hobby. After giving this phase of the subject serious thought, the "Cine Filter Slide" with five filters was conceived. This is a device that is readily attached to the camera lens and enables easy and instantaneous change from one filter to another—without unnecessary loss of time or other inconvenience. A simple adjustment of the slide, brings into position the desired filter.

The holder can remain permanently attached to the lens mount serving the valuable function of a cleverly designed sunshade. When a particular filter is centered over the lens, it locks automatically into place.

The five filters are **ortho-yellow** for cloud effects, snow scenes, and seascapes; **panchro-green** gives proper tonal proportion to a blue sky, trees, and a red afternoon sun; haze for color movies to absorb the invisible ultra violet rays that tend to over correct the blues in your color movie film; light red when contrast is desired; and medium red for very pronounced cloud effects and the production of night time and moonlight effects in daylight shooting. The price for this Cine Filter set complete with case is $7.50. Further information from Photographic Specialties, Inc., 1123 Broadway, New York City.

A NEW SLIDE PROJECTOR for black and white or color films, with a patented heat absorbing unit to provide sure protection against burning or buckling of the film, is now made available to photographers by the Keystone Manufacturing Co., Boston, Mass., makers of Keystone 8mm. and 16mm. movie cameras and projectors.

An efficient cooling chamber built into the slide projector acts as an additional safeguard against ex-



cessive heating of the slides and makes possible longer showing of individual transparencies.

Other features of this new projector, which is suitable for films of all miniature cameras, are 200 watt illumination, F4.5 5-inch Wollensak projection lens, three unit condenser assembly, automatic centering of slide carrier on each picture, 2"x2" standard slide holder, sturdy die cast lamp house and cast base with leveling screws. The size of the projector is 10"x7¾"x 9½" high and the weight is eight pounds. It sells for $34.50 and Keystone materials for making slides are available.

THE ROLLS ROYCE

THE 16 MM. BOLEX was designed by E. Paillard and Company of Yverdon and Ste. Croix, Switzerland as a moving picture camera which would include all the refinements found in the best professional equipment.

The tri-focal view finder is of tubular design, regularly corrected for 1", 15 mm. and 3" lenses. The field of the finder may be adapted to all other focal length lenses. The View-finder is also parallax-correcting, assuring accurate centering from 18" to infinity, presenting the exact field at all distances. The semi-circular turret head will accomodate three lenses, mounted by the international standard type "C" thread. Unique design permits using 15 mm. f1.5 in taking position without interference in field when telephotos up to 7" are also in the turret.

The shutter is a rotating disc, 190°. It is of the focal plane type, revolving at 118/1000ths of an inch from the film plane. This eliminates all distortion and produces better definition than has been possible heretofore.

The camera runs at all speeds from 8 to 64 frames. The single exposure release permits making animations, and the variable shutter speed control gives speeds of from 1/10th to 1/100th of a second for "stills."

Threading is automatic, assuring loops of proper size, and eliminating unsteadiness and jamming. Films may be changed in less than one minute.

The hand crank may be used for filming either forward or reverse action. A governor controls the speed of the hand crank to the speed set on the indicator. The hand crank is especially useful when making superimpositions or lap dissolves.

Clutch instantly disengages spring motor for rewinding film. An entire reel may be rewound in the camera if desired, permitting changing from one emulsion type to another when "photographic weather" calls for a change in emulsion.

The footage counter is fully automatic, it adds and subtracts accurately. An audible footage counter complements the other in that a distinct "click" is heard as every 10 inches of film passes the gate.

The Bolex 16 mm. camera, equipped with a Hugo Meyer 1" f1.5 Primoplan, or 1" f1.5 SOM Berthiot, sells for $275; with Leitz Hector Rapid, 1" f1.4, for $295. Other lenses are available from 15mm. to 7". A hand made leather carrying case to accommodate camera, lenses, filters, and three 100 rolls of film is $25.00 additional.

Further information on this outstanding motion picture camera as well as details on the line of Bolex projectors is available from The American Bolex Company, 155 East 44th Street, New York City.

KELCO PROJECTION LAMPS

RAYGRAM CORP., 425 4th Avenue, New York City, announces that it has taken over Eastern distribution for the Kelco Projection Lamps, recommended for Motion Picture and Stereopticon Service.

NEW CONSTRUCTION. The physical construction of the completed lamp is somewhat different than the ordinary projection lamps, inasmuch as it does not employ the usual porcelain or glass supports for holding filaments and, therefore, does away with the heavy masses which tend to interfere with best performance of high intensity lamps of this type. This is particularly true of the bi-plane type. By using this new type of construction, it is possible to obtain closer centering of the filaments which is of special value particularly when used for 8 mm. projection. "Black Dome," which all the KELCO PROJECTION LAMPS are made of, is a covering of black glass at the top of the lamp, which increases the heat radiation, and eliminates top glare. It is not necessary to use a metal cap with this type of construction. Over 25 years of lamp engineering experience is back of Kelco Products.

NEW EASEL BOARD

PENN CAMERA, 126 West 32nd Street, New York City, is introducing the "Pennex" Easel Board. This board is constructed for the exacting needs of the amateur. Four bands held square can be adjusted for any margin desired. The weight of the entire frame is centered on these bands. This prevents the curling of the heaviest paper. Those who make small size prints will find it convenient to work from the center of the board. The adjustable bands make this possible. The full size of the board is 11"x14". Write to them for further information.

NEW MAGAZINE-LOADING 16 MM. CAMERA

INCORPORATING FEATURES which heretofore were not available to amateur movie makers, the new Filmo 141, a 16 mm. magazine-loading camera of unique design, made its bow to the market July 1st.

Features not usually found in cameras of this type, but incorporated in the new Filmo 141, include the radically new "projected area" viewfinder, four camera speeds, and a single frame exposure device opening up the interesting field of animation work.

Operation of the Filmo 141 is exceptionally simple. The beginner has but to slip the ready-loaded film magazine into the camera, close the door, and he is ready to shoot black-and-white or color film. The advanced amateur will make use of the various speeds, single frame exposures, interchangeable lenses, critical focuser, etc., for the more versatile effects he has learned to achieve.

A New Type of Viewfinder

The most radical departure from previous design is the "projected area" viewfinder, a positive type of viewer. The advantages of the new viewfinder are these: When using the conventional or negative type of viewer, the operator will inadvertently shift his eye a little, to one side of the eyepiece or the other, or up or down, and as he does so, the field he is centering will change its limits according to the motion of the eye. With the "projected area" viewfinder, the field area image is immobile, no matter what the angle at which the eye looks into the eyepiece.

The eyepiece of the viewfinder is set in a soft rubber cup, which prevents side glare and which also renders the camera easy to use by persons wearing glasses.

Uses Eastman Film Magazines

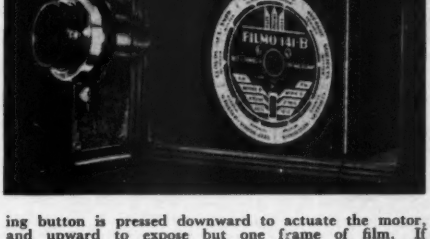
The new Filmo 141 takes Eastman film magazines, each of which is provided with its own individual footage indicator, the dial being plainly visible through a window in the camera.

Taylor-Hobson Cooke Lens

A color-corrected 1-inch F2.7 Cooke lens is standard equipment on the Filmo 141, and since the camera has the same lens mount as the Filmo 70, all lenses used on the latter cameras are interchangeable with the 141.

The B&H Mechanism

The mechanism is controlled by a governor which, Bell & Howell claims, maintains a constant rate of film movement, thus insuring even exposure throughout the entire film run. The shutter is of the rotary type, giving uniform exposure over the entire frame area, and its open segment of 133° gives an exposure of 1/43rd second at 16 frames per second. The start-



ing button is pressed downward to actuate the motor, and upward to expose but one frame of film. If pressed all the way down, against a light friction, the starting button remains in the running position, permitting the operator to enter the picture himself.

The new Filmo will be available in two models, differing only in the operating speeds. The 141-A will have speeds of 8, 16, 24 and 32 frames per second, while the 141-B operates at 16, 32, 48 and 64 f.p.s. Bell & Howell calls attention to the importance of the intermediate speeds, 24, 32 and 48 f.p.s., for "smoothing out" pictures made from moving vehicles as well as the inevitable pam shots, and for slowing down too rapidly moving objects.

THE CAMERA Division of Wholesale Radio Service Co., Inc., has announced the addition of two new items to their line of cameras and photographic supplies.

Extensive research has resulted in the production of the new Lafayette Minigrain, an extra fine grain developer that increases the rated film emulsion speed approximately two-fold.

Due to a special compounding process, neither time, temperature, nor climatic changes will effect its quality. Pure chemicals of U. S. P. standard are used.

The second new product is the Lafayette Chemically Pure Acid-Fixing Powder. Described as suitable for use with all makes of papers, films and plates, Acid-Fixing Powder is compounded from the purest of chemicals under a special formula and whether used hot or cold, is stainless.

The above products are distributed exclusively by Wholesale Radio Service Co., Inc., of 100 Sixth Avenue, New York, with branches in Chicago, Atlanta, Boston, Newark, Bronx and Jamaica.

SIMPLER SCALES FOR G-E EXPOSURE METERS

FOR THOSE who prefer fewer figures on the scale plate, the General Electric exposure meter is now also available with a single-arc scale. Involving no changes in the meter itself, the new scale provides complete camera settings with the aid of the calculator although it does not interpret exposure data at a glance—as does the full-scale unit. This scale, offered as an alternate to the direct-reading unit, will prove valuable to many less-technical users.

The G-E meter gives accurate readings in bright, medium and dim light for movies or stills, in color or in black and white. Since it becomes a light meter when the hood is removed, the G-E exposure meter is finding interesting new applications. Many photographers are using it in the darkroom for calculating the correct enlarging time. It is also being used to simplify print-making by measuring the transmission factors of negatives.

CENTRAL'S NEWEST BOOK READY

AMATEUR and profesional protographers may receive free the new Central Bargain Book of Cameras and Supplies, recently published by Central Camera Co., 230 South Wabash Avenue, Chicago. This new 32-page catalog lists and describes hundreds of cameras, (still and movie), lenses, tripods, exposure meters, enlargers, films, darkroom supplies. Central has been in the mail order business since 1899. Moreover, Central carries in stock, what is said to be one of the world's most complete, varied supply of cameras and photographic equipment.

35MM. PRINTER-ENLARGER

A new automatic speed printer enlarger just introduced by the makers of ARGUS speed cameras will admirably meet the exact requirements of thousands of amateurs. It prints standard 2¼x4¼ enlargements direct from 35mm. double-frame negatives faster, simpler and at lower cost than for contact prints of similar size. All the operator has to do is place his ARGUS Bromex paper and give the handle a flick of his finger. This makes the electrical contact and exposure. There is no focusing, no trimming, no complication, no muss. Anyone can easily make 200 prints an hour with this equipment at a cost as low as a penny a picture.

The printer weighs only 6¾ pounds, and costs only $15.00. The standard model operates on AC current. A special condenser adapter required for use with DC current is available at $1.00.

ARGUS Bromex paper in a wide variety of contrasts, surfaces and weights is ready cut to the sensible new standard size 2¼x4¼ in exact proportions to 35mm. double-frame negative dimensions. Single-weight sheets are packed 36 to the package, double weight sheets 24 to the package at 35c per package. There is good distribution on this, but in case your dealer hasn't got it, the maker is International Research Corp., Ann Arbor, Michigan.

THE INTERCONTINENTAL Marketing Corporation, 8 West 40th Street, New York City, American distributors of Perutz Film, announce with pleasure that a second Perutz international award comes to America. Mr. Ernie Mack, of 23 West Plaza Street, Reno, Nevada, gathered the honors with his beautifully exposed shot of a brilliant snow scene.

MILLIMETER FLASH GUN

IF YOU OWN one of the following cameras you can use the new M/M Flashgun by Abbey: Super Ikonta B, Retina II, Leica, Contaxes II and III, Automatic Rolleiflex, Robot.

The manufacturers have styled this the "Millimeter" Flashgun because it is intended for use with the cameras the formats of which are usually stated in millimeters. Small and lighter than most of the cameras for which it is intended, it is Abbey's response to the demand for a flash synchronizer which would, in the miniature camera field, provide the efficiency, the dependability and the ease of operation now enjoyed by owners of the flashgun for Speed Graphics and folding bed types of cameras.

The Millimeter Flashgun does not depend on a cable release socket as the connecting means. Instead, in each camera considered, the Millimeter synchronizing acts upon the finger release. No attempt is made to offer a single tripping unit which will serve for all of the cameras. Instead, the units are wholly detachable and designed especially for the pressure, timing characteristics and position of each shutter. Thus the tripping unit for the Super Ikonta B, while similar in appearance, will not operate the shutter of a Contax or Leica camera. The tripping units are sold separately for $12 each; the battery case, reflector (fully adjustable for all sizes of lamps), and mounting bracket for $8.75—the complete outfit in every case totaling $20.75.

The Millimeter Flashgun is completely satin chrome plated. Standard adjustable reflector is 5 inches in diameter and the tripping unit in each case is magnetically controlled from the battery case. Side lighting is built in without extra charge while facilities for remote control; tandem lighting and multiple flashing are provided. Write to the Abbey Corp., 305 E. 45th St., New York, for more complete description.

R. P. CARGILLE, 118 Liberty Street, New York, manufacturers of the famous SEE-SHARP, has just introduced a new $1.00 item for all ground glass focusing, called the "PIC-SHARP."

"PIC-SHARP" is made of soft, pliable rubber with a lens in the center. It is small enough to fit into a vest pocket.

The principle of Pic-Sharp is to give ground glass focusing "needle-sharpness" in their picture taking without any guess work. We predict a real market for this item which has eye appeal as well as real value.

AREO AND TELEPHOTO PERUTZ FILM

PERUTZ FILM, long known here and abroad for its universal use among miniature camera fans, adds a new emulsion to its list. This new film, known as AEROFILM (fliegerfilm) is suited to long distance shots, both from the air and from more secure positions on the ground. It is a stable orthochromatic emulsion, rated at 18° Scheiner. Its increased sensitivity to blue, and fine green reaction results in clear, brilliant negatives. Definition is high and grain is said to be unusually fine. The negative material has excellent keeping qualities.

Another new Perutz emulsion for 35 mm. cameras is known as PERVOLA and was also created for aerial photography and telephoto work. Pervola is somewhat faster than Aerofilm, having a Scheiner rating of 22°. This new panchromatic emulsion permits the use of red and orange filters for aerial work, and is especially indicated where poor light conditions or filters make a faster emulsion necessary.

For complete details on these two new emulsions, write to Intercontinental Marketing Corporation, 8 West 40th Street, New York City.

FREE EXPOSURE GUIDE

NEW COMPLETE Exposure Guides on the correct use of the five Superflash Photolamps with all Agfa, Defender, DuPont, Gevaert and Kodak films have just been published and will be sent without charge to anyone writing the Wabash Photolamp Corp., 335 Carroll Street, Brooklyn, New York.

F1.9 LENS FOR KEYSTONE AND B&H

HENRY HERBERT adds to the versatility of 8 mm. movie making with a new Dallmeyer f:1.9 lens for the Bell and Howell Filmo Double 8 cameras, and for the Keystone 8mm. machine. This new precisionoptic fo-

cuses from 1 foot to infinity, stops down to f:16. Its focal length is 13mm. An f:1.9 lens will give new thrills with your 8. Night shots, brilliant color scenes, even under "adverse" lighting conditions, fully exposed s-l-o-w motion pictures are just a few new fields that can be explored. For Bell and Howell Filmo Double 8 models 134-H, and 134-G, and 134-E the price is $75.00—for the Keystone 8, $67.50. Write for information to Henry Herbert, 483 Fifth Avenue, New York City.

Henry Herbert has another new aid to the fans, a tripod swivel head, light enough to hold a heavy camera. The new item is called TILT-O-RAMA, Jr., at $4.50. This new camera and tripod go-between is made of handsomely polished aluminum. The long goose neck support allows the camera to be tilted to any position without interference. A large ball and socket joint holds it there till you are ready to move it.

OMAG KITS FOR ARGUS

THE CHESS-UNITED COMPANY, distributors of OMAG Filters tell us that a number of requests have come to their office regarding OMAG filter kits for Argus cameras. They have asked us to announce that an OMAG filter kit is available for all models of the Argus at a price of $4.50. This kit includes four solid-colored optical glass filters. The filter assortment contains a yellow filter for orthochromatic photography, a green filter for indoor photography under artificial illumination. The mount is of the interchangeable slip-on type. In addition a sunshade is furnished to fit over the mount or the lens barrel. The filters are made from solid-colored optical glass, ground and polished to precision plan-paralleity. Information may be obtained from the Chess-United Company, Emmet Building, Madison Avenue at 29th Street, New York City.

PRIX FIXE

THE AMERICAN BOLEX Company, 155 East 44th Street, New York City, distributors of the Bolex cameras and projectors, announce that BOLEX HAS fixed prices according to the Fair Trade Act. On and after June 10, 1938, the selling prices of Bolex cameras, projectors and accessories will be fixed as determined by provisions of the act.

LOW PRICED MOVIE FILM

VISUAL INSTRUCTION Supply Corp., of 1757 Broadway, Brooklyn, New York, announce a new low-priced 16 mm. reversal film. The new product will be marketed under the brand name of "Black and White" and lists for $1.98 per 100-foot reel and includes processing.

Attractively boxed and produced to meet the demand for low-priced roll film of satisfying quality, it looks as though "Black and White" films will create a niche for themselves without much delay.

The Visual Instruction Supply Corp., have been in the amateur movie field for a long period of years.

WITH THE EVER increasing use of Leica, Argus and other 35 mm. cameras, a quicker and more economical means of making perfectly graded positives on either perforated paper or film for projection has become a necessity.

A new device has recently been introduced to meet this need. Strip prints are now made on a special printer with a Photoelectric Exposure control which grades each frame individually and reproduces the true quality of your negative so that you may know what to expect of your enlargements.

The best feature of this machine is its automatic operation. This assures a negative unmarred by finger prints or scratches. A further safeguard is the double-sided container which holds the negative on one side, the Record Strip Print on the other. This makes a handy package which your dealer can deliver to you when you ask for Record Paper Strip Print.

For further information, write to Emby Photo & Film Machine Corp., 630 Ninth Avenue, New York City.

BUILD IT YOURSELF

AN INTERESTING development in the Photographic Field is the introduction of "CAM-CRAFT" Build-It-Your-Self dark-room equipment. Already available are a Contact Printer, Electric Print Dryer, Print Press and Paper Holder in three sizes. More items are following. Each CAM-CRAFT KIT contains complete parts, cut and shaped—all ready to be put together. A screw-

driver is the only tool necessary. The manufacturer states that the simple plans and directions enable the average person to assemble each article in about one hour. CAM-CRAFT (at present distributed by Econo-Cam Supply Co., 260 Troy Avenue, Brooklyn, New York) will provide plenty of fun for those who like to build their own equipment.

A NEW COLOR CAMERA

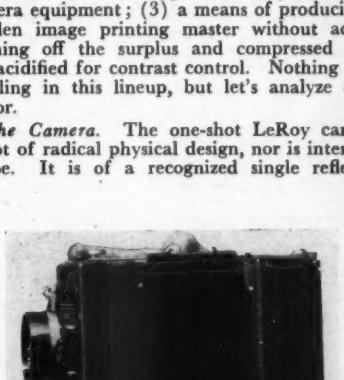
By HERBERT C. MCKAY

Natural color has served as a hook upon which to hang so much hokum and bunkum that those rare occasions which bring something to get enthusiastic about are true red letter days. There is something new in photography of natural color, and this something is a system.

The new system is the result of intelligent application of principles learned through years of working with photoengraving problems. The process was developed by Adrian LeRoy of New York.

The system consists of (1) a camera of good quality, of the single reflector type; (2) a densitometer which is supplied as a part of the camera equipment; (3) a means of producing a swollen image printing master without actual washing off the surplus and compressed dyes pre-acidified for contrast control. Nothing very startling in this lineup, but let's analyze each factor.

The Camera. The one-shot LeRoy camera is not of radical physical design, nor is intended to be. It is of a recognized single reflector



type. The extension of the lens board is supported by full length, sturdy metal bars insuring a parallel lensboard at all focal lengths. The camera is light enough to be held freehand without discomfort, and is attractively finished in bronze enamel and chromium.

However, a camera is a camera. *What will it* do? (1) This camera will produce a set of three-color separation negatives in more perfect balance than has ever been achieved before! Now, of course, that statement needs explanation because we know that balance varies with each change of emulsion and each change of light. The camera is normally balanced to the Defender Tricolor film (NOT the *Tripack*). Compensation for the daylight-to-Mazda variation is accomplished by using a different yellow record (blue filtered) film.

(2) Because all light sources change in qual-

ity from time to time, an absolute balance cannot be maintained, but a practical densitometer is supplied with each color camera, so that any *slight* variation may be detected and compensated in later steps of the process. However it is usual to find negatives with printing times on the order of 16-17-16—quite close enough.

(3) The Washoff process is but a variation of one of the oldest of color printing processes —imbibition. The original process produced the dye holding effect by altering the dye holding power of the emulsion. There was no relief of any kind. Relief was substituted because the older imbibition had a tendency to bleach out in highlights and to bleed at the edges of color areas.

However, there are other ways of treating gelatin, as in photo-gelatin printing, where the image is raised into relief by differential swelling. There are several common photographic processes based upon this reaction. However in the LeRoy process a degree of swelling has been obtained which provides a perfect color transfer master, yet in which the gelatin matrix is so durable that it can be used as a printing plate. In fact we saw such a matrix pounded with a regular carpenter's hammer, directly on the face without ruining it!

The swelling agent must be carefully prepared from selected materials. For this reason it is supplied by the makers to users of the process.

One of the principal difficulties encountered by the amateur when using the conventional washoff method has been to control the pH of his dye solutions. A dye too acid or not sufficiently acid will not produce the proper results. To overcome this, the new process makes use of compressed dye tablets, *already acidified* in various degrees for flat, normal or contrast positives. Thus the amateur is provided with three degrees of color contrast, much as if he were using the three common grades of printing paper. These cameras in the 2¼ x 3¼ size are being produced in sufficient quantity to permit their being sold, complete with densitometer for a lot less than $200.

Yes, it sounds impossible. Your technical editor went to investigate this camera and system with blood in his eye and skepticism in his mind—but the longer the investigation proceeded the more he became convinced that here at last was a practical, candid, one-shot, three-color separation camera coupled with a system which would enable the average amateur to make his own satisfactory color prints up to 11 x 14 inches.

To set any doubts at rest, we have not been discussing a camera for use with direct color film such as Kodachrome or Dufaycolor, but a real, professional type of one-shot camera for making separation negatives by instantaneous exposures. The manufacturers plan soon to announce the LeRoy separation camera for making separation negatives from Kodachrome transparencies.

The system has been adopted by the writer as a basis for his class instruction in natural color photography, as well as for his own direct color work.

???QUESTIONS???
to the Editor

Q. Using an opera glass for telephoto pictures as described in the February and March issues of MINICAM, I get splendid results for some pictures, but others are fuzzy and unsharp. I focus the opera glass visually and then fasten it to the front of the camera. For determining exposure time, I assume *f*22 as the opera glass opening and this works out very well.

ANS. Opera glasses, being designed for vision only, are not corrected to obtain visual and chemical coincidence of foci. Human eyesight varies from person to person. For these two reasons, it may be necessary to make a slight correction.

Focus by eye and then, before fastening glass to camera, slightly *increase* the extension of the opera glass.

The exact amount of extension required for your individual eyes and your particular opera glass may be readily determined if the back of your camera is removable. It is necessary only to place a piece of transparent paper or ground glass in the film plane, the place normally occupied by the film, and focus the opera glass on a bright, distant subject until it is sharp on the ground glass. Then remove telescope from camera and focus it by eye, noting the extent of adjustment needed. The camera is set at infinity at all times.

Q. Is it possible to take double exposures with a Leica camera without injuring or altering the mechanism. I have seen it done and would like to take some double exposures of night scenes and fireworks.

A. Double or multiple exposures can be made with a Leica camera despite its automatic film transport. This is done by not releasing the shutter plunger immediately but holding it down while turning the shutter speed dial on top of the camera, then lifting the finger from the shutter release. If the film transport knob is not turned, the film remains unmoved in the camera while the shutter is rewound in this fashion for as many exposures as desired on one piece of film.

MINICAM'S DEPARTMENT FOR CINEMA-MAKERS

Cinécam

The Technique of PANTOMIME

By FRANKLIN A. WOOD

Illustrated by the Author

How to film a story that will test, not actors' ability, but the technique of the director and photographer.

TO fully understand the new application of this technique, it is necessary, first, to get a bird's eye view of existing amateur film productions.

They fall, usually, into two classes. In the first, there is a series of pictures of Aunt Tillie and friends waving at the camera. The second is an imitation of the Hollywood product.

Why are both of these approaches usually disappointing — leaving the amateur cinematographer with a feeling of incompleteness and dissatisfaction?

In the first, too little is undertaken; in the second, too much. As a result, the amateur cinematographer decides that he's not such a great movie director after all. And only because he has failed to select proper material. Like a violinist trying to play a piano, his difficulty is not lack of ability but use of the wrong instrument.

The logical step is for the amateur cinematographer to do away with dialogue entirely, to limit subtitles to as few as possible and, above

● Utilize the neglected technique of Pantomime to direct and shoot this story with a cine — or minicam.

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all, to create a movie that is intelligible and understandable without a running line of extemporaneous chatter to explain it; a movie that is good enough to stand on its own feet.

When the technique of pantomime is understood by a stage or screen actor, a director, without the use of dialogue or other explanation, can produce the most eloquent action. The actor moves face, hands or other parts of his body. A shrug of the shoulders may be more expressive than a thousand words.

The beauty of pantomime in the hands of the amateur movie director is that it may be utilized even by inexperienced actors, providing that the right actions are selected. The art of pantomime is appreciated today by the Balinese, the Chinese, the Hopi Indians of Arizona and other races who remain close to fundamentals. Their dances and dramas are eloquent.

On the screen, pantomime was beginning to come into its own about the time the talkies were born. Charlie Chaplin, perhaps the greatest screen pantomimist, refused to make "talking pictures" and was perfectly justified in his stand.

To study the technique of pantomime, let's follow an example through from beginning to end. First we will describe the direction and then the photography.

By selecting a story requiring the minimum of props, characters, and acting ability, we can concentrate on our chief job—directing and action.

"Park Romance" seeks to present a series of sequences building up to a logical

climax. It's going to be a "piece of action," not a complete movie.

We decide to tell it in 50 feet of 8 mm. so we will shoot 100 feet in order to provide 50 per-cent leeway for cutting. (In 16 mm., 100, and 200 feet, respectively.)

A 10-second scene in 8 mm. requires 2 feet of film, so our 100-foot budget will allow 50 scenes providing they average 10 seconds each. Some will be longer, and some shorter, but we won't worry about scene length until we get to the editing.

Scenes will be selected which will be dependent not on acting ability, but on directing ability.

"Park Romance" is a story that isn't especially new, but it is suitable for filming. The story, as told in narrative form, might be as follows:

Scene 1. (page 99) Two backs on a park bench. Worlds apart. Conscious of each other, yet strangers. That space between, it's unbearable. How to eliminate it, wonders the young man. It will take time, tact and technique. Hurrying will spoil everything. Patience and perseverence is the only way.

Scene 2. She is aloof and disdainful.

Scene 3. The campaign begins. Hands on the bench; the young lady's nonchalantly (perhaps accidentally?), the young man's hand moves purposefully but with deliberate nonchalance.

Scene 4. She is interested but reticent.

Scene 5. Contact. The young man's knee turns toward the young lady's as he touches her little finger.

Scene 6. Touched my hand! How dare he!

Scene 7. The young man's heart stands still but not his hand. He rushes in where angels fear to tread, turns toward her and brings to a climax the preceding scenes.

Scene 8. A smile. Success. The world is won.

Scene 9. Truly a park bench romance.

(*Page* 105, *please*)


A B C D E F G
H I J K L M N
O P Q R S T
U V W X Y Z
a b c d e f g h i j k l m n o
p q r s t u v w x y z
B B B B

How to Hand Letter PRINTS AND FILM TITLES

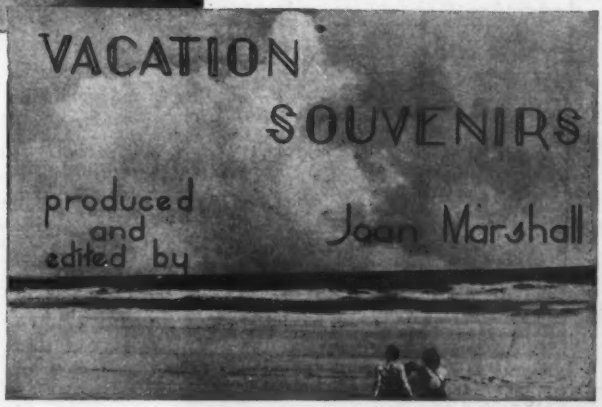
A simplified lettering system especially designed for use in photography.

By C. Elmer Black
Illustrated by the Author.

MANY a photographer, gazing at a salon print, has envied a hand-lettered title which sometimes goes far to give that finished appearance and make a picture a success. This detail now can be supplied by anyone without previous experience in lettering; and hand drawn titles also can be supplied for photographic greeting cards, home movie titles and sub titles.

How easy it is may be seen from studying the alphabets shown on the preceeding page. Note that all of the letters having curved portions are developed from a simple circle which is easily drawn with a compass. For the small or "lower case" letters, the same radius is used for each letter—this promotes speed and facility.

Ordinarily, the lower case "s" is probably the most difficult of all let-



● With no other tools than a ruling pen, small compass, and a straight-edge, the method outlined here will enable anyone to quickly turn out creditable work after a short period of practice. How the ruling pen is used is shown above. A movie title (right) may readily be drawn on a print and photographed with the movie camera.

ters to construct, but in this alphabet, the difficulty is overcome by using part of a circle and a diagonal line instead of the customary reverse curve. The crosses on letters "f" and "t" can of course be made horizontal, but a modern touch is achieved by using the diagonal in conjunction with the "s" and the dots over "i" and "j" as shown.

The capitals or "upper case" letters are so designed, that, with the exception of "I," "M," and "W," all are of approximately the same width. This makes it necessary to use two different radii, but by following the guide-line spacing, which controls the size of the radius of each circle, this is easy to follow.

The tools needed are a draftsman's ruling pen and small compass. Any straight edge or ruler will do and black India ink is obtainable at stationers. The guide lines should be drawn lightly in pencil and can be erased, if desired, with art gum or other soft eraser after the inking is completed.

At the start, it is advisable to follow the guide line spacing, but after proficiency is attained, the proportion of the letters may be changed to fit individual needs. Estimating the spacing of the letters by eye, then will save time.

This lettering is particularly suitable for the movie maker to use in creating titles because of the speed and individuality possible by this method. Black letters are drawn on white cardboard for positive film, but by using reversible stock more unusual effects are possible. As illustrated, the titles can be lettered on enlargements which suggest the theme of the story. Either a separate print is used for each title or the lettering done on clear cellophane and placed over the enlargement before photographing. Similar variations are of course well known to the movie amateur.

As an added refinement on greeting cards, fill in the space between the double lines of the upper case letters with water colors to give an attractive appearance. In the case of a Christmas card, for ex-

ample, having a verse of say four lines, color the capital letter of the first line red, the second green, the third red again, and so on. This carries out very well the feeling of the season.

To produce a photographic greeting card, the desired lettering is made on the print and then the complete job is copied with a camera. The print on which the lettering is done should be a semi matte surface and several times the size of the final card. The resultant reduction in the copy negative will minimize flaws or erasures in the lettering.

When a greeting card is to result from a negative by contact printing the lettering can be made on a separate negative or sheet of transparent celluloid the same size as the negative. The lettering is made on the celluloid and then the two are taped together. Retouching fluid will help the ink stick. The result in this case will be white lettering.

Good lettering is a valuable adjunct to the photographer and the simplification of his problems by the use of these alphabets will be appreciated the more they are used.

Technique of Pantomime

(*Continued from page* 101)

Scene 10. "And I liked you from the first moment." The silhouettes may be photographed moving toward each other for the second, and major, climax and fade out if desired.

No. 11. This clinch might be considered an anti-climax, but it is good and logical pantomime.

To photograph "Park Romance," shoot at least 25 scenes like the above.

Note that the man's face was not shown, it being decided that this was a superfluous detail that could only complicate the story without adding anything. The story in the simplest possible fashion describes the gradual meeting of two personalities. No dialogue was used although one might imagine that words would be the most important things when two strangers meet.

The same sort of story could be told

with feet, showing them gradually becoming closer until finally the woman's feet are shown on tip toe, next to the man's—to portray a kiss by suggestion.

Whether using a minicam or a cinecam, the photographing technique is the same. Select a plain background. Note that the gray background in the pictures shown here is just a few shades darker than the light tones in the girl's face. The background when it is dark is still plain. The sudden change from light to dark background is to increase the contrast of the shifting scenes.

Where it is desired to furnish smooth scene changes, the pictures are kept in approximately the same tone. Lighting the subject is a problem in portraiture. Note the downward shadow under the girl's nose. This indicates the position of the main light which was a single photo flood in a reflector, directed from about four feet above her head.

The general illuminant was a second photo flood in a reflector about twelve feet in front of the subject. Using a pan film, the exposure was *f*4.5. With a still camera the shutter speed would be 1/25th second. The exposure in any case might be varied to suit the particular lights used, and daylight is recomended.

● Boy, will this make a swell "Pan"!

THE LAST WORD

THE NEWEST BOOK FOR MINICAM WORKERS

"Miniature Camera Work" is edited by Willard D. Morgan, and Henry M. Lester. It contains 310 pages, 500 illustrations, 20 color photographs, 175,000 words of text, and the large page size of 8½ x 11 inches.

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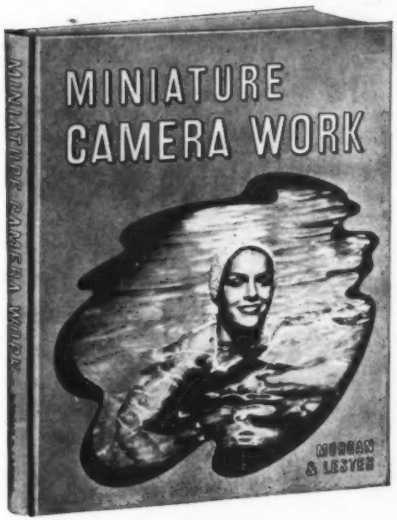

A Quotation from "Miniature Camera Work"

"Children when taken off guard produce the most unexpected patterns. They seem to record themselves on the film all sprawling and gangling. Some of these sprawling and gangling pictures which have come my own way are herewith reproduced. They do not seem to run at all to the familiar type that shows one or two children fishing (ragged pants and big straw hat) or on the beach (shovels and pails). In fact some of these sprawling and gangling pictures do not at first glance convey much aesthetic pleasure; they run counter to adult notions of smooth easy order. I confess that these knobby pictures have come to fascinate me more than the smoothies. In the conflict between the truthfulness of childlike angles and our aesthetic demand for well-proportioned shapes and spaces, perhaps aesthetics will have to do some yielding in the end: or rather, our aesthetic perceptions will have to expand in order to admit this new kingdom."

. . . from Chapter 9, page 137, Children and Pets, by DOUGLAS HASKELL

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